

Q10.5
C53
M5
S4g

QUARTERLY

The seal of The Chicago Medical School is circular. It features a caduceus in the center, with a book and a lamp of knowledge on either side. The words "THE CHICAGO MEDICAL SCHOOL" are inscribed around the perimeter of the seal.

THE CHICAGO MEDICAL SCHOOL

VOLUME 4, NUMBER 2

OCTOBER, 1943

BUY

WAR



BONDS

Medical
84
11-10-43

The present issue presents a widely diversified selection of articles, all of current interest • The first article on neurosis, by Dr. Dreikurs, gives us an idea of the problem which neurosis engenders for the physician • The next article, although rather short, is a very timely one on infantile paralysis by M.D. Shapiro • Dr. Roberts gives us something from the pure sciences in his article on spectroscopy • The surgical treatment of one of the most common of human ailments, varicose veins, is ably discussed by Dr. Wolffson • Something strictly on the cultural side is the interesting discussion of jazz by M. Ziporyn, which should throw some light on the subject for many of us • Dr. Levine's article on leukemia makes very clear the rather complicated subject of this class of blood dyscrasias • A comprehensive survey of the treatment of coronary thrombosis is presented by M. Sacks • The article by J. Goldflies on the subject of cryptorchidism is a learned treatise which should prove very interesting to many of us • The feature article of this issue shows the workings of the Obstetrics Clinic and the Home Delivery Service of the Chicago Free Dispensary, The Clinic of The Chicago Medical School. • The remainder of the magazine contains the usual features, such as alumni news, faculty news, social notes, organizations, book reviews, and abstracts which are always of personal interest to our students, alumni, faculty, and our other friends who have been supporting our school and our publication.

QUARTERLY

Published Quarterly Under the Auspices of

THE CHICAGO MEDICAL SCHOOL

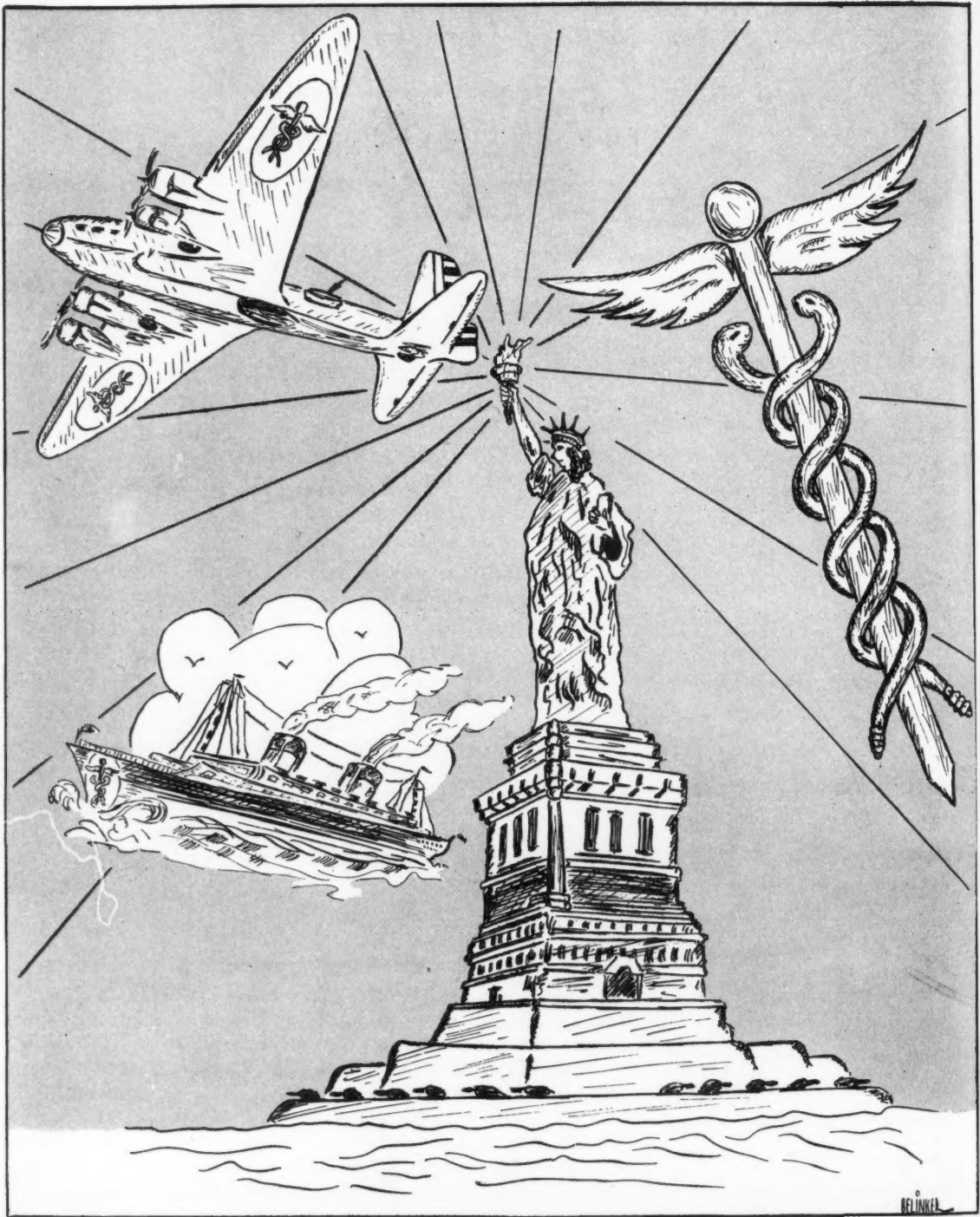
VOLUME 4, NUMBER 2

OCTOBER, 1943

CONTENTS

EDITORIALS	3
NEUROSIS, A CHALLENGE TO MEDICINE— Rudolph Dreikurs, M.D.....	4
ACUTE ANTERIOR POLIOMYELITIS—Max Dee Shapiro.....	7
SPECTROSCOPY OF PROTEINS, FREE AND IN SITU— Richard G. Roberts, Ph.D.....	8
SURGICAL TREATMENT OF VARICOSE VEINS— Sol Milton Wolffson, M.D.....	10
ON JAZZ MUSIC—Marvin Ziporyn.....	13
LEUKEMIA—Victor Levine, M.D.....	14
TREATMENT OF CORONARY THROMBOSIS—Michael Sacks.....	16
EFFECT OF CRYPTORCHIDISM UPON TESTICULAR FUNCTION—Jerome Goldflies.....	18
OBSTETRICS CLINIC AND HOME DELIVERY SERVICE— B. Tumarkin, H. Lesser, M. Lerner.....	20
ALUMNI	22
FACULTY NEWS	24
SOCIAL NOTES	24
LESTER N. SELIG.....	25
ORGANIZATIONS	27
LETTERS TO THE EDITOR.....	29
ABSTRACTS	32
BOOKS	33

THE STAFF OF THE QUARTERLY. Editor in Chief, Herman L. Weisberg; Associate Editors, Bernard Lieb, Daniel C. Belden, William Schreiber, Max Dee Shapiro; Members of the Editorial Staff: A. Harry Barasch, E. Chusid, M. Feldman, J. Goldflies, D. Halpern, N. Helman, S. Lazarus, M. Lerner, H. Lesser, A. Levin, C. Peckler, N. Rapoport, B. Rockliff, L. Tilkin, M. Wohl, M. Ziporyn, A. Zweibel; Business Manager, Eugene Brodsky; Business Staff: R. M. Adelman, D.D.S., M.S.D.; Advisory Board: Maxwell P. Borovsky, M.D., Richard G. Roberts, Ph.D., Harry Culhane, M.D., Henry A. Smith, M. D., John C. Evans, D.D., Jay A. Smith, Ph.D.



EDITORIALS

OUR MEN IN SERVICE

AS ONE enters the school building he notices on the wall behind the information desk two large red banners with a large blue star on a white field in the center of each. On one banner reads the legend, Faculty, 325, and on the other the legend, Alumni, 52. These numbers represent the number of men from The Chicago Medical School who are serving with the armed forces of our country. Since the beginning of the present war our men have been enlisting in steadily increasing numbers, until at present almost one third of all the alumni of our school are in some branch of the armed forces. Among these men are some of very high rank, and others who will rise to higher ranks. Upon all these men rests the responsibility of the health and medical care of our fighting men. We proudly say they discharge their responsibility with skill and with honor. They have set a high example for those who follow them into the armed forces to emulate; but those who follow will not fail. Good luck and speedy Victory!



INFANTILE PARALYSIS

THE country is now being ravaged by the most severe and serious epidemic of acute anterior poliomyelitis in its history. The toll is especially heavy in some of the southwestern and eastern states and is steadily spreading. The metropolitan area of Chicago is suffering the worst siege it has even known, and it threatens to become worse. The number of cases is becoming so large that hospital facilities are becoming overcrowded with polio patients.

It seems a very sad thing that, although the causative agent of the disease is known, the means of transmission and route of infection are as yet unknown. This makes prophylaxis very difficult, if not impossible. Therefore, since prophylaxis against the disease is not as yet possible, and since the pathologic processes which take place are fairly well known and generally accepted, it seems only logical that the best way of combatting the disease is to recognize the disease as early as possible and to prevent the progress of the pathology by early active treatment. To this end we now have at our disposal the Kenny method of treatment of infantile paralysis, a method which is radically different from the orthodox treatment, but which, nevertheless, is producing very gratifying results.

Mere treatment, however, cannot solve the problem of eradicating infantile paralysis. It is good that treatment is improving, but we cannot be satisfied until we have found the means of preventing the disease and its spread. This remains one of the goals of our men and women of medicine, who will some day, no doubt, reach it as their predecessors have succeeded in attaining some of their "unattainable" goals.

NEUROSIS, A CHALLENGE TO MEDICINE

RUDOLPH DREIKURS, M.D.

Professor of Psychiatry, The Chicago Medical School

The psychopathological condition called neurosis, or psychoneurosis, or, simply, nervousness, presents a problem of particular significance, not only to all physicians, but to everyone living in the sphere of our culture. It is a matter of fact that a great number of diseases for which a physician is called present either partly or entirely neurotic symptoms. There seems little doubt that the majority of all civilized people, especially those living in cities and cultural centers, suffer occasionally or constantly from nervous disturbances. Such frequent occurrence of any disease is alarming in itself; it is, however, aggravated by the lack of understanding of its nature on the part of the majority of patients as well as of physicians. Only recently medical science succeeded in discovering the mechanism of neurotic disorders; and the findings of psychiatric research are still quite controversial. The contradictions of the psychiatric reports and the comparatively short time elapsed since the first classic studies of neuroses (around 1900) are partly responsible for the ignorance of many physicians and of otherwise well-informed and educated laymen with regard to a condition of such vital significance to them.

There is still another factor which hinders us in understanding and recognizing the nature of neurosis, a factor which is responsible also for the great discrepancy in psychiatric reports. Unlike any other disease, neurosis is a disturbance which does not permit the affected to realize from what he is suffering. And, since all of us, the public as well as physicians, and, perhaps, even more, we the psychiatrists are inclined to become neurotic, as a consequence, our objective judgment becomes impaired in studying our own deficiencies. Psychiatrists who founded their schools of thought while investigating neurosis mingled their own personal or cultural outlook with their observations on patients.

The problems of neurosis can be understood only if we get a clear picture of human nature, of the creativeness of the human mind, of the fallaciousness and trickery of human intelligence. Neurosis is the name of a disease, but actually it is a human arrangement imitating all characteristics and symptoms of diseases. The scientific study of any other disorder will start with the diagnosis, with the description of the symptoms. It is impossible to give an exhaustive enumeration of neurotic symptoms, because any dis-

turbance of any human function can be found in the case history of a neurosis. For a long time physicians regarded the absence of pathological conditions as the main and only distinction between a neurotic, or functional disturbance and an organic disease. If the symptoms could not be explained on the basis of clinical and laboratory findings, then they were considered "neurotic" or "nervous."

Physicians, being trained and instructed to trust only the mechanics of physiology and pathology, find it difficult to understand neurosis. They are inclined to disregard the "unjustified" symptoms completely, ignoring the patient's claim to be sick; or they look for "organic" reasons for the peculiar symptoms, which produce neither laboratory nor clinical findings. In both instances they are on the wrong track. The patient, being told to be well while he suffers considerably, becomes as disgusted with the physician as the latter is with the patient. The patient who *feels* sick certainly *is* sick. However, if his illness is of neurotic origin, all hope of finding the pathological organic condition for his disease will be in vain. The objective clinical findings in psychoneurosis are only incidental, caused by the increased tension of the whole body, especially in the vegetative system. All objective signs of neurosis, such as increased reflexes, tremors of the fingers and eyelids, dermatographism, and similar symptoms, are only signs of this increased inner tension. The symptomatology of neurosis is not based on organic changes in the body, but on the emotional and mental activity of the patient who influences his bodily functions by his thoughts, his feelings, attitudes, and expectations. The vegetative system seems to be the link which permits the close integration of body and mind.

It is not possible to separate the wholeness of the individual into body and mind. They both belong together, influence each other, and are in constant interaction. A patient with an organic disease is also mentally sick; he suffers, loses interest and zest, becomes apathetic or irritable; physical ailment, or mere fever may produce even psychotic symptoms. On the other hand, any emotional upheaval, any inner conflict, fears and excitement, may alter the normal physiological functions of the body. Behind the nervous disorder is always a psychological conflict. The symptoms from which the patient suffers are ex-

pressions of this conflict. We must understand the nature of the conflicts and the mechanism of the symptoms in order to get a clear picture of the structure of neurosis.

Several theories are advanced to explain and describe the nature of the conflicts which produce neurotic disturbances. The school of Reflexology, which is much in accordance with the ideas of Behaviorism and with Pavlov's "conditioned reflexes," maintains that friction between various habits and reflexes is responsible for neurotic disturbances. The Psychoanalytic school blames conflicts between natural drives, mainly the sexual drive, called Libido, and the social pressure, presented by the Superego, for all psychopathological aberrations. Both theories describe psychological conflicts in a rather mechanical way, as "intrapersonal" friction, whereby the individual becomes just the battleground for hostile forces which sweep him off his feet and into the tortures of a neurosis.

Other scientists, psychiatrists and sociologists, are inclined (like the writer) to regard psychological conflicts as the result of difficulties which the individual has in meeting his social obligations. They point out that the human being is mainly a social being. Whatever we call human, and whatever distinguishes man from animals, is derived from close and intensive social intercourse.

In his social adjustment man developed the ability to talk. All typical human qualities are refined and specialized methods for dealing closely with other individuals. Whatever is called good or bad is called so only in regard to its social significance, its advantage or disadvantage for social intercourse and cooperation. The case studies of patients suffering from neurotic disturbances reveal that social status, the feeling of being accepted, of belonging to others, dominates all other human interests. If the relationship with the environment is disturbed, conflicts arise and nervous symptoms may develop. The little child prefers any ailment to the sorrows of being rejected or deserted, and is willing to take on any suffering if it brings him attention and affection from his parents. We adults are not much different. No physical ailment can be compared to the agony of losing prestige, of feeling frustrated and humiliated. Being worthless or inadequate is interpreted as social ostracism and is regarded as worse than any disease which, at least, brings consideration, sympathy, and attention. Many prefer sickness to failure.

Such considerations seem to be becoming more frequent and assume today almost the characteristics of a

psychological epidemic. Many factors in our present culture concur in producing this particular attitude of overconcern with one's own prestige, of inferiority feelings, and of willingness to suffer and to be sick in order to avoid obvious failure. This attitude toward life and toward society, so characteristic of the nervous personality, is rather easily understandable when we consider the conditions in which the majority of us live, and the methods by which our children are brought up.

There is, first, our highly competitive society, in which each individual is compelled to prove his personal worth if he does not want to be overrun by his fellowman. It was different in a feudal society, in which each individual had his definite place. He did not need to strive so hard, as he never could reach higher than the limit of the caste to which he belonged. But he did not need to fear the loss of his social status, either, because neither money nor personal performance was essential for his social position. Today we find ourselves in constant fear of losing whatever we personally have gained in the struggle to achieve a higher social position. To make the confusion worse, all methods which until recently seemed to guarantee social status and security, crumble before our very eyes. Neither money nor a job, neither beauty nor glory, protect in time of general insecurity like ours. There is no one living today who is not affected by the general apprehension, by the fear of economic or social disaster.

To make things worse, a time of change and transition, of economic and social upheaval, finds our contemporaries very little prepared; our methods of rearing children provides them with very few opportunities to gain confidence in their own strength. Spoiling and pampering the children become increasingly the educational principle of parents who themselves feel insecure and try to overprotect their children, as if disaster could thus be avoided. Our children become only more deeply involved in the vicious circle of competition which produces fear in the loser and in the winner alike. One suffers from his experience of being inferior, and the other never is sure that he will continue to win. This competition fills our family life, the relationships between husband and wife and between parents and children; and disturbs greatly the relations between children, who regard each other with envy and suspicion to see whether one gains more attention, excels, or proves to be superior. Our educational "grading" system serves only to intensify the child's feeling that life is a contest.

In this general atmosphere grows the fatal mistake

that personal prestige and superiority are all that counts; under these social conditions, fears and inferiority feelings spare nobody. That is the fertile ground on which neurosis grows. These are the conflicts which we find at the bottom of every neurosis.

The nervous symptoms begin invariably at a moment of personal difficulties in life. It is a moment of discouragement, when the individual decides that the social problems which he has to face are too difficult. That is the moment when he withdraws from some life task, either from work, or from social relations with friends or relatives, or from love and marriage. It is always a feeling of personal inadequacy which creates the inner tension, the apprehension, with which the neurotic disorders begin. There is no objective measurement for the decision whether any particular situation, or any particular social obligation, is actually too much and too difficult. All depends on the subjective interpretation of the patient, of his goal in life, of his life-style. A person with a very highly developed ambition, one who believes that he *must* be the first or he will be lost, the perfectionist, will get discouraged where someone else sees no danger to his social status. The person with much social interest, who is less interested in his own prestige than in the welfare of others, who enjoys being useful and knows how to be, the individual with courage who knows that he can stand anything and that he will be able to make the best of any situation, will stand greater hardships without withdrawing, without becoming afraid and nervous.

We can be sure that any nervous symptom is directed against some particular situation, against some social task, against some duty or some person. One question is very helpful in determining the meaning of any particular neurotic disturbance: If the patient is asked what he would do, or how his life would change, *if he were well*, he invariably will reveal the direction of his neurosis: "I would get married," or "I would get a job," or "I would be able to do a better job," or "I would go out and meet friends," or "I would get along better with my wife," are some of the characteristic answers. They indicate that the patient is sick because he wants to avoid marriage or work, or because he needs an excuse for his failure at work, at social contacts, or in his family life. The patient is not aware that he uses his ailment as an excuse. If he would admit to himself that his symptoms are not, as he believes, the *cause* of his failure, but only a device for avoiding his responsibility, if the patient could see these connections, the symptoms would become futile.

We can understand psychological conflicts in human beings mainly as social conflicts, conflicts between the personal interests of the individual, between his "private sense" and his social conscience, his "common sense" (Adler). The psychopathological reactions to such conflicts vary. In patients who suffer from a psychoneurosis, these conflicts are solved in the way just described, the patient developing some symptoms which excuse his failure and his withdrawal. The condition in psychosis is quite different, especially in schizophrenia and in manic-depressive psychoses. Here the social conflict is resolved by a delusional change of reality or by its complete removal; instead of adjusting his own conscience to personal interests, as the neurotic patient does through his symptoms, the psychotic adjusts reality to his "private" sense, through his delusions. The psychopathic personalities, on the other hand, the perverts, swindlers, alcoholics, and criminals find their solutions by denying their social obligations altogether. There are apparently certain psychopathological conditions necessary for the development of psychotic disturbances. We are here concerned only with the problem of neurosis, how a discouraged individual can develop neurotic symptoms.

First we must attempt to classify the various nervous symptoms. We have already mentioned that any human function can be disturbed in a neurotic sense, so that it is impossible to enumerate all symptoms. For the sake of classification we can, however, divide all symptoms into three groups: disturbances of *feeling*, of *thinking*, and of *body functions*. In the first category fall all emotional disturbances per se. There is first of all *fear*, which is most pronounced in phobias and anxiety states, but which exists more or less in any neurosis, as fear is the basis of the neurotic attitude toward life. Besides the various types of phobias, like agoraphobia, claustrophobia, erythrophobia, fear of disease, of death, there are other emotional symptoms, like depression, temper, and tantrums. In the group of disturbances of thinking belong first the obsessive-compulsive neurosis, but also all obsessive ideas, worries, and jealousy. The third group of disturbed bodily functions includes the wide field of organ-neurotic symptoms, which are the object of the new Psycho-Somatic Medicine. Here belong the symptoms which were first described as and named "hysteria." They are rather primitive reactions of simple muscular or sensitive functions, convulsions and pareses, anaesthesias, deafness and blindness. There is further the so-called neurasthenia which derives its name from another phase of psychiatric investigation,

(Continued on page 30)

ACUTE ANTERIOR POLIOMYELITIS

MAX DEE SHAPIRO

At the present time, as this article is being written, the dread finger of acute anterior poliomyelitis is being dragged rather heavily through Chicago and its suburbs. Daily the number of cases reported swells, and it appears that this is the worst epidemic in years. This has, of course, resulted in an inevitably aroused interest and curiosity as to any recent further advances in the study of the disease.

The most recent advance in the study of acute anterior poliomyelitis has been the changing attitude of the medical profession toward the formerly scoffed at Kenny treatment. The Kenny treatment was officially inaugurated in the United States when Sister Kenny came here in 1940 from Australia. Since her arrival in this country, she and her associates have made many converts.

To understand the rationale of this form of treatment, one must accept a slightly altered concept of the disease from what was formerly believed. The orthodox concept of polio is one of a degenerative process of the anterior horn cells of the spinal cord resulting in a flaccid paralysis of the involved parts, eventually leading to contractures and deformities. The Kenny concept of this disease is that those muscles that oppose these flaccid muscles, i.e., their antagonists, go into spasm, and that in many instances the so-called paralysis is the result of the spasm and pain which, in turn, result in functional paralysis of the opposing muscles. It is on this concept that the treatment is based.

According to the Kenny concept there are three major symptoms in the early stages of the disease, namely, *muscular spasm*, *incoordination*, and *mental alienation*. Cole, Pohl, and Knapp, (1) who were working with Sister Kenny in Minneapolis, define these symptoms in the following manner. *Muscular spasm* is defined as "a group of symptoms including fibrillary twitchings (fasciculation), hyperirritability of the muscle to stretching, and a more or less tonic state of contraction of the muscle fibers which frequently cannot be overcome even by great force". The principal sites of these muscle spasms are in the hamstring muscles, the muscles of the back and neck, the gastrocnemius, the pectoral muscles, the muscles of respiration, the quadriceps, and the biceps of the arm. *Incoordination* is described as being of two types: "1) that due to the spreading of motor impulses intended

for a certain muscle to other muscles or groups of muscles due to such conditions as pain on attempted motion of the involved muscle or inability of that muscle to perform its proper function, and 2) that occurring within the involved muscle itself, so that ineffective contraction is produced instead of a coordinated rhythmic contraction producing maximum motion at the insertion of the muscle." *Mental alienation* is described as the "inability to produce a voluntary, purposeful movement in a muscle in spite of the fact that the nerve paths to that muscle are intact. This is a physiologic block which must be distinguished from the organic interruption resulting from the destruction of the anterior horn cells by the disease."

The Kenny treatment, as described by Krusen (2), may be mentioned at this point. "The muscle spasm is treated by the application of hot fomentations or packs. In this procedure the joints are almost never covered. The affected regions are wrapped quickly in the three layer pack. The packs usually are renewed every two hours, but may be applied as often as every fifteen minutes, if the spasm is acute."

The incoordination and mental alienation are treated by re-education of the muscles. Passive movement is instituted as early as possible, or as soon as the muscle spasm can be relieved. It is on this point that there is such a great variance of opinion between the proponents of the Kenny treatment and the proponents of the orthodox treatment. Formerly, and many today still advocate it, it was believed that the initial onset was one of flaccid paralysis and that the best thing to do was to put the part at rest by immobilizing it. Consequently, casts were and still are being applied. However, if one accepts the Kenny concept of the onset of the disease, one can readily see that such a form of treatment would be easily conducive to the formation of contractures and deformities. On that point we might state that, as Krusen puts it, he can concur on the observation that they have seen no contractures, malalignments, or spinal curvatures attributable to contractures following the Kenny treatment. This alone, naturally, indicates a distinct improvement over the usual methods of treatment.

This, in essence, is Sister Kenny's concept of acute anterior poliomyelitis and briefly explains the treat-

(Continued on page 24)

SPECTROSCOPY OF PROTEINS, FREE AND IN SITU

RICHARD G. ROBERTS, PH.D.

Associate Professor of Physiological Chemistry, The Chicago Medical School

The study of proteins as organic compounds was begun by Mulder and Liebig about one hundred years ago. The methods of organic chemistry proved to be of great value in this pioneering work and in later work done upon the proteins, but biochemists began to realize by the turn of the century that the tried methods of their day were definitely limited as far as the chemistry of proteins was concerned. It became apparent that the protein molecule was of enormous size, relatively; that it was composed by hundreds of smaller molecules; that it often was combined by various linkages with non-protein material and that the water and electrical distribution within the molecule greatly affected its chemical and physical behaviour. The realization of these facts instituted a more intense desire for new tools of research with which chemists could attack such baffling problems.

The new research tools that were developed and found to be most effective, were for the most part physical, and belonged more properly in the field of physical chemistry. Thus, was begun the application of physical methods to the study of biochemical compounds. The new workers deviated somewhat from the molecular forces that had been used so much by the chemical pioneers, and added to them the powerful forces of the gravitational field and the electromagnetic field. We think of methods depending upon ultracentrifugation, electrophoresis and spectroscopy in this connection. One naturally thinks of X-rays and the cyclotron also, but here again radiant energy is involved. If we consider a centrifugal field as a modified gravitational field and a gravitational field as composed of extremely short waves, then the new methods involve only an extension of wave mechanics.

Spectroscopy which is the principal theme of this paper, can be conveniently divided into three parts; the emission spectrum, the Raman spectrum and the absorption spectrum. The emission spectrum does not lend itself greatly to the study of the proteins. The reason for this is that in emission spectroscopy the sample is volatilized at a high temperature, and, therefore, the structure of the protein is completely destroyed. To this extent it is worse than the chemical methods which also destroy the structural framework in various amounts depending upon the methods used. However, the metals contained in proteins can be determined by the emission method. For example, we

can determine the iron in hemoglobin, the copper in hemocyanin, and the magnesium in chlorophyll which is attached to a protein in plant life. The quantity of metal present is determined by comparing the density of certain characteristic lines in the spectrum of the sample to similar lines from a known standard in a comparator or microphotometer.

The Raman spectrum was discovered by Raman, a Hindu physicist in 1928. In this case, the sample is excited by ultra violet light from a mercury vapor lamp, and it can be surrounded by a jacket of quartz through which a cooling liquid circulates. Therefore, organic structures are not destroyed. The Raman effect involves the collision of a photon with a molecule under conditions such that there is an interchange of some of the energy of the photon. Usually the photon imparts some of its energy to the molecule. The wave number of the scattered light is then smaller than that of the incident light. It is possible, however, for a photon or quantum of incident radiation to absorb a quantum from a molecule and leave with greater energy. In either case a record of the spectrum formed can be obtained on a photographic plate, just the same as was done with the emission spectrum that was obtained at a higher temperature. The Raman spectrum, however, requires a much longer exposure. A mathematical interpretation of the Raman phenomenon implies the interesting concept that all matter is composed of atoms, electrons and quanta or photons.

The absorption spectrum has proved to be the most valuable for the study of proteins, free or in situ. When the protein is studied in situ its basic structure is not disturbed, and, furthermore, the linkages of the protein to non-protein material or to other proteins is not disrupted. Furthermore, these linkages, which are of great interest to biochemists, can leave a record of their own to be studied. For example, one can study the proteins in a living amoeba or in the transparent thoracic muscles of a bee. If a wax moth is used for study the insect can be held in front of the slit of the spectograph, and the little animal can be made to remain at rest or to attempt to fly away. If a small platform is placed beneath its feet, it will remain at rest, but when the platform is removed it will attempt to fly. When the insect exercises its wings oxygen will be consumed more rapidly, and it will go into an oxygen debt. Its muscular tissues will,

therefore, be at a lowered reduction potential. Such changes in potential greatly affect cytochrome which is an iron porphyrin protein compound. In the reduced state the characteristic absorption bands of cytochrome are very intense, while in the oxidized state they almost completely disappear. With hemoglobin the reverse is true. When the moth rests, it stores up oxygen, and its oxidation potential rises. Therefore, it is not only possible to study the absorption bands of proteins when they are in situ, or remaining in their natural living environment, but also to determine their oxidation-reduction potential.

In absorption studies some source of light giving a continuous spectrum such as the hydrogen lamp or a so-called black body such as tungsten is used. The light passes through a slit into a monochromator, which will be described later, and then through the specimen or sample which may be a solid, liquid or gas. The amount of light which has passed the system described can be determined by the blackening of a photographic plate, or by its action on a photoelectric cell, or on a thermocouple. Therefore, if one knows the intensity of the incident beams or the amount of light passing through a non-absorbing ma-

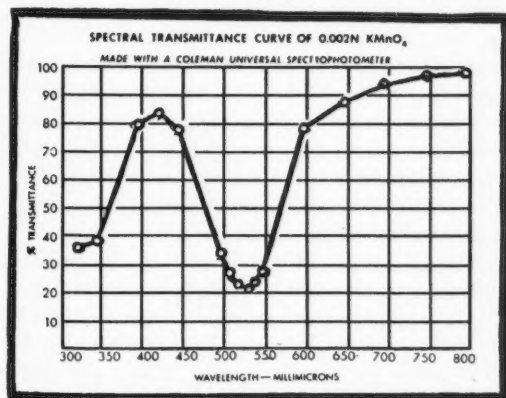


Fig. 1

terial, or coming from a standard source such as an iron arc, and then makes a similar determination with the sample to be studied, the difference will represent the absorption. The amount of absorption, however, is not a direct function of the thickness of a solid or of the concentration of a liquid or a gas, but as was shown by Lambert and Beer, it is a logarithmic function instead. In situ studies are more difficult experimentally, involving both microscopy and spectroscopy, and to Keilin and Caspersson we owe much for the fine technique developed.

It was Sir Isaac Newton who, in 1672, discovered

the visible spectrum. He permitted a beam of sunlight to pass through a pin hole and strike a glass prism in a darkened room. He held a white screen behind the prism and upon it he beheld the beautiful spectrum of the sun. He probably deserves to be called the Father of Spectroscopy. However, great scientist that he was, he did not realize that in the dark shadow of the screen that he held in one hand

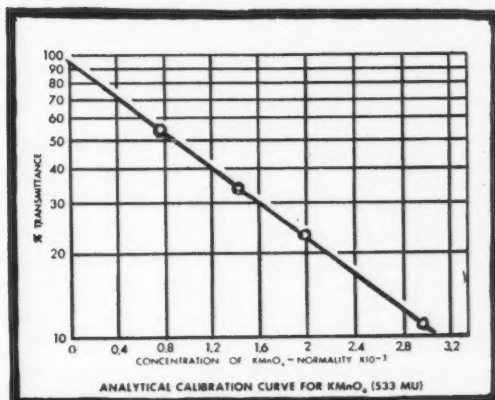


Fig. 2

lay the secret of the infra-red rays which pointed to the magic of radio, and in the other the ultra-violet rays that pointed to the blessing of X-rays. It is usually not given to one man to comprehend the gamut of such great discoveries, and after Newton nature closed the door on radiant energy and spectroscopy for a century. And indeed it was not he who first forged the key to open the door, but it was Grimaldi, a Jesuit, who in 1665 discovered the diffraction of light by holding the point of a needle in a beam of light coming from a small orifice into a dark room. A piece of white paper was held behind the needle, and the fringed edges of the images formed upon it of the needle gave the clue to interference and wave motion.

The century passed and far away from Italy and England an American named Hopkinson was sitting on the doorstep of his Philadelphia home. The evening shadows fell and down the street on his nightly mission came the man who lighted the street lamps. When the lamp in front of the Hopkinson home was lighted, Mr. Hopkinson, perhaps in jest, held his silk handkerchief in front of his face. What he saw apparently interested him more than the three cornered hat of the astute lamp lighter, for he saw three black lines on his white kerchief. He thought that if he waved the cloth, the lines would also move, but they

(Continued on page 36)

SURGICAL TREATMENT OF VARICOSE VEINS

SOL MILTON WOLFFSON, S.B., M.D.

Associate Professor of Surgery, The Chicago Medical School

Associate Attending Surgeon, Cook County Hospital

By the term *varicose veins* we mean a tortuous, segmental dilation of the superficial venous system of the lower extremity, principally an involvement of the saphenous network. With regard to the incidence of this condition, it is difficult to give exact figures. But from examinations of representative groups of young industrial workers, approximately ten percent have been found suffering from varicose veins.

Etiology—The saphenous network of veins has been put under strain due to the erect posture of man. Varicose veins are virtually unknown in quadrupeds. In man, nature has provided an adaption to the erect posture by means of many valves in the saphenous veins in order to prevent the backflow of blood. The distribution of the valves however, shows marked variations in position in different individuals. The position of the saphenous veins, lying between the skin and the deep fascia, deprives the veins of muscular support, thus making possible increased venous pressure which may produce changes in the veins. Another factor in the causation of varicose veins is congenital weakness of the vein walls, which allows the vein walls to give way under the strain of hypostatic congestion and other conditions increasing the intravenous pressure. Individuals manifesting this congenital weakness are usually of the asthenic type, having low blood pressure and often suffering from hernias, flat feet, etc. Direct causes may be considered as pregnancy, intra-abdominal tumors, or other conditions causing an increased intra-abdominal pressure. Phlebitis, which may destroy the venous valves, and trauma to the vein walls are other causative factors.

Anatomy—The venous system of the lower extremity comprises two sets of veins, namely the deep and the superficial system. The deep veins are placed among the muscles of the leg and thigh, and unite to form the deep femoral vein which enters the pelvis under Poupart's ligament. The superficial veins lie in the fat, superficial to the deep fascia. The long, greater, or internal saphenous vein arises in the dorsal venous arch of the foot, passing upward over the medial malleolus. It then crosses medial to the internal condyle of the femur, passes along the inner and anterior aspect of the thigh over Hunter's canal, and terminates at the fossa ovalis where it joins the femoral vein. This point of union of the saphenous and femoral veins is called the sapheno-femoral opening.

The lesser or external saphenous vein collects the blood from the further aspect of the leg and heel. In both sets of saphenous veins, valves are present which normally prevent the backflow of blood. These valves may be unicuspid or bicuspid. The sapheno-femoral opening is guarded by a tricuspid valve.

Classification—McPheeters has worked out the following, excellent classification of varicose veins according to size: Size 1—Veins $\frac{1}{2}$ Cm. in diameter, Size 2—Veins $\frac{1}{2}$ to 1 Cm. in diameter, Size 3—Veins 1 to $1\frac{1}{2}$ Cm. in diameter, Size 4—Veins $1\frac{1}{2}$ to 2 Cm. in diameter, Size 5—Varices which are larger than 2 Cm. in diameter and which require a definite description as to their size and shape. There are also fine varices which are called *bursts* and which may be either of the spider or rocket type.

Pathology—The changes which occur in varicose veins are the results of increased venous pressure on a hollow muscular tube, causing first an hypertrophy, and later dilatation, elongation, and tortuosity. The more or less constant inflammatory reaction in and around the walls of varicose veins would seem to indicate that bacteria which were present in the blood stream have lodged in the sluggish venous pools where the drainage is incomplete. Thinning and dilatation of the veins occurs first proximally to the valves, and then tends to spread distally. As a result of the loss of muscular tone, and infection, a phlebosclerosis occurs. As the walls of the veins become dilated the edges of the valves are pulled apart and can no longer function properly. By this mechanism the reverse flow of the venous blood becomes established and increases until the large, dilated superficial veins form saccules of blood which fill and empty according to gravity. In a well developed case of varicose veins, as the venous blood flows upward past the saphenofemoral opening, some of it regurgitates backward toward the foot. This is more pronounced when the valves are not functioning, and when the leg is in a dependent position.

Symptomatology—The earliest symptoms of venous insufficiency of the lower extremity are a heavy, tired, aching sensation in the legs, with cramping in the calf muscles at night. When the veins become markedly dilated, the pressure and traction on the accompanying saphenous nerve may cause a painful radiation along the course of the nerve. The degree of

pain is not necessarily proportionate to the size of the varicosities, as some small varices may be extremely painful, while other very large ones may produce almost no discomfort. The bulk of the symptomatology of varicose veins is due not so much to the veins themselves as to the complications such as phlebitis, ulceration, eczema, or accompanying skin infection.

Diagnosis—Trendelenburg, in 1890, was the first to discuss the pathological conditions found in varicose veins, and his description is so classical that since that time the method of determining the direction of venous flow is known as the Trendelenburg test. In order to understand the mechanism of the Trendelenburg test, we must take into consideration the following anatomical points: The blood from the deep veins flows outward through the sapheno-femoral opening, due to the defective valves, then downward through the superficial veins, to re-enter the deep veins of the lower leg through the communicating veins, where it is again forced upward by the constricting forces of the leg muscles. Thus a true vicious cycle is established, increasing as the extent of the varicose veins increases. The Trendelenburg test is made as follows: The patient is placed in a recumbent position, and the leg to be examined is elevated higher than the body. The effect of gravity thus empties the distended veins and they quickly disappear. A tourniquet is placed over the upper thigh, tight enough to compress the superficial veins but not the deep ones. The patient is then made to stand up, and the tourniquet is left in place. This is called the Trendelenburg constriction test. Failure of the varicose veins to distend within 30 to 60 seconds indicates that the communicating veins and the deep system of veins are functioning properly, and that the blood from the superficial system is entering the deep system by way of the patent communicating veins. This is called a Trendelenburg constriction negative result. If the superficial veins begin slowly to distend within 30 to 60 seconds with the tourniquet in place, this means either that the deep system of veins is incompetent, or that the communicating veins are incompetent, or both. This would be called a Trendelenburg constriction positive result. To complete the Trendelenburg test, we again have the patient lie down, remove the tourniquet, and allow the distended veins to empty by gravity. The tourniquet is then replaced, and the patient is told to stand up. The tourniquet is then quickly released and the results observed. This is called the Trendelenburg release test. If, after the tourniquet is removed, the veins quickly become distended, this is an indication

that the long saphenous vein is incompetent and varicosed, and would be called a Trendelenburg positive release result. Failure of the veins to fill quickly after removal of the tourniquet would be called a Trendelenburg negative release result. Another test which is often done but is not absolutely necessary, although it helps to confirm the findings of the Trendelenburg constriction test, is Perthe's test. This may be done in either one of two ways: The patient is placed in a recumbent position and an elastic bandage is wrapped snugly around the leg in circular fashion from the toes to the sapheno-femoral junction. The patient is then instructed to stand and to walk about the room for several minutes. If cramping pains in the leg muscles result, this is an indication that the deep venous system or the communicating veins or both are incompetent. A variation of this technique is to place the patient in a recumbent position, empty the veins by gravity, and place a tourniquet about the leg. The patient is then told to stand up and flex the leg vigorously at the knee ten or twelve times. If the deep veins are patent, the superficial veins will collapse from this form of exercise if the deep veins or the communicating veins are not patent, the distended superficial veins will fail to collapse.

Complications—Among the more common complications of varicose veins are: 1. Varicose Eczema, in which due to a change in the reactive powers of the epidermal cells, either by direct injury or by nutritional interference, a loss of surface resistance occurs, and a vesicular eczema results. This is usually the source of much annoyance, may be painful, and leads to a chronic itching dermatitis. Palliative treatment is often effective, but cure is usually not obtained until the underlying cause, namely, the varicose veins are corrected. 2. Varicose ulcers are the most frequent complication of varicose veins. They develop as the result of trophic changes in the lower part of the leg and are usually secondary to trauma or local infection. A thrombosis of the terminal arteries occurs and a local tissue edema results. The associated varicose veins continue to saturate the area, which is already trophically below par, with a poorly oxygenated, stagnant, venous blood. The condition usually becomes progressively worse and, as a rule, the ulcer with its associated cellulitis continues to spread until the patient is virtually disabled. The treatment of varicose ulcers may be divided into two phases, palliative and curative. Under palliative treatment may be mentioned the following: Application over the ulcer of sponge rubber covered by an Ace elastic bandage, and the application of an Unna's paste boot. This

latter measure has had a considerable vogue, and if properly applied and left on for from six to eight weeks, may be successful in healing the ulcer. Such healing, however, is usually only temporary, and the ulcer is likely to recur following unusual or even normal activity. The active treatment consists in the eradication of the underlying cause, namely, the varicose veins which feed the ulcer. The treatment will be described later. 3. Thrombophlebitis which is the formation of a thrombus within the lumen of a vein, usually the result of an inflammatory reaction, and attached to the wall of the vein. The lumen may be partially or completely occluded. This condition may affect either the superficial or the deep system of veins. The deep veins are often affected in the course of a pneumonia, typhoid fever, general infections, and as a result of surgical operations. The cause of involvement of the superficial group of veins is often obscure and may result from hematogenous or local causes. Associated with the thrombophlebitis there is often an obstruction of the lymphatic system of the leg or thigh, giving rise to a swollen, white, and edematous leg commonly seen post partum, and called *milk leg*. Infectious thrombophlebitis is always a potential source of fatal pulmonary embolism. This condition is best treated by a combination of conservative and surgical therapy. The conservative therapy consists of bed rest, cold compresses for the first twenty-four to forty-eight hours, followed thereafter by warm, moist fomentations. Along with this, systemic measures including chemotherapy with the sulfonamides is used. If the superficial system of veins is involved, it is well to do a high saphenous ligation to prevent the breaking off of a portion of the thrombus with resultant embolism. At the time of ligation, the distal portion of the saphenous vein may be injected with a sclerosing solution, thus locking the infected thrombus below the newly formed chemical thrombus.

Many forms of treatment for varicose veins have been tried from time immemorial, some with a fair degree of success, and others with little success. Many years ago surgical excision of the entire saphenous vein was much in vogue. This was known as the Schede operation, and there are many elderly people living today who bear the disfiguring scars of this form of treatment. The cure was often worse than the disease. Injection treatment of varicose veins was tried as far back as 1853. The pioneer in this form of therapy was Chassaignac, who used the then recently invented hypodermic syringe. The solutions used by Chassaignac, Vallet, Trendelenburg and others in those days were strongly corrosive and coagulating,

and one can readily imagine that complications, such as large tissue sloughs, were very frequent. This caused the treatment to fall into disrepute, and for many years there was a reversion to the more conservative forms of therapy such as the wearing of elastic stockings, etc. About 1923 there began a renaissance of the injection therapy when Linser, Kausch, and Genevriev began using respectively, concentrated, hypertonic sodium chloride, hypertonic sugar solutions, and quinine-urethane. The refinements of the techniques and the solutions have led us to the injection treatment as we know it today. For a decade or more, injection therapy alone, using the invert sugars, forty percent sodium salicylate solution, and sodium morrhuate, five to ten percent, were used almost exclusively. And while the results were better than anything that had been achieved before, recurrences were nevertheless less common. Within the last decade, a combination of the injection treatment and of saphenous vein ligation has come into popular vogue and is the accepted treatment today.

Before the surgeon can proceed with the active obliteration of varicose veins of the leg, several factors must be taken into consideration. If the deep system of veins is not patent, one can readily see that the obliteration of the superficial system of veins is likely to lead to gangrene. It is, therefore, mandatory that the surgeon familiarize himself with the Trendelenburg and Perthe tests, and that he perform these tests upon every patient before planning surgery. A positive Trendelenburg constriction result is a definite contra-indication to the occlusion of the superficial system of veins. Other contra indications are extensive cardio-vascular disease, active infection at some distant focus in the body, and compensatory varices. Contrary to the belief formerly held and still held by many surgeons, infectious thrombophlebitis is not a contra-indication and, as a matter of fact, ligation of the long saphenous vein at the sapheno-femoral junction with retrograde injection is an accepted form of treatment, and one likely to preclude embolism.

The treatment used by the author, which is not original but a compilation of various techniques, is as follows: Small varices are treated by the injection method alone. The solution of choice is 5% sodium morrhuate, which is injected into the varicosities after they have been emptied of blood, followed by a tight compression bandage. The amount of solution injected at any one sitting varies with the size of the individual varicosity. Five to ten c.c. may be injected at one time, obliterating a segment of from two

(Continued on page 28)

ON JAZZ MUSIC

MARVIN ZIPORYN

Most of the so-called jazz or swing heard today is of the "commercial" variety, dance arrangements of popular tunes designed with a sharp eye on the market. Some of this music, whatever its esthetic value, is very ingenious and brilliantly played; but it is a purely commercial thing and, as such, it does not justify a discussion of its artistic merits. I should like to speak about real jazz, that musical idiom of which American musicians have been speaking now for more than a quarter century and which they play for their own pleasure. All of the commercial forms borrow from it to some extent. It is sometimes mixed with the commercial and the same men often play both commercially and naturally.

This genuine jazz is often an intricate, spirited music. Many definitions have been attempted, but the only result of these attempts have been statements such as "a band swings when its collective improvisation is rhythmically integrated." The reason for this inability to define jazz is that it is a language. It is not a collection of rhythmic tricks or tonal idiosyncrasies, but is a distinctive melodic-tonal-rhythmic idiom, as is Japanese *gogaku* or Balinese gong music. A language, of course, cannot be defined. A rough idea of what it is about may be gained by hearing it. Beyond that, what it communicates depends on what the listener knows of its form.

Jazz is the child of folk music, and retains many ancestral qualities. It is spontaneous, full of improvisation, and full of the lyric subtlety of men speaking a loved language with enthusiasm. In it, one can hear intense Negro spirituals, revival hymn chanting, blues, ballads, popular songs old and new, marches, and throbbing, hard, white-hot rhythm music for dances. This music is a living, moving music, and moves in rhythms that are varied and persuasive.

There is every reason why, at first, this music may confuse even an elastic ear. It is generally unfamiliar in rhythm, tone color, and style. But one way of seeing the merits of this music is to apply a fundamental axiom of musicology to appreciate music, hear it repeatedly, of course. I don't guarantee such ecstasies as Jacques-Henri Levesque suggests in the Paris magazine *Le Jazz Hat*. There, in an article quoting Stravinsky and St. Thomas Aquinas, he stated that "this dynamism (jazz) . . . interprets life at its maximum of intensity. It may be regarded as a constant vital

phenomenon of the type that one finds in all fields of activity where life is manifested powerfully and freely." M. Levesque went on to suggest Napoleon in war, Carpentier in boxing, and Casonova in bed. Of course, the gentleman is over-enthusiastic, but I quote him to show the effect of the music on its devotees.

Naturally, the question arises as to the place of jazz in the world of music in general. What does jazz contribute to music as a whole? The answer to this is that musical experimentation takes place on three levels: in the composition of concert music, in popular music, and in the improvising of folk music (where jazz comes from), and that there is cross-fertilization between the levels (poor Tchaikowsky!). The influence of jazz will appear in all music that is written in the near future. The language involves certain definite extension of musical form in general; these have already allowed a wide range of imaginative play, are far from exhausted, and, just as they have appealed to Stravinsky, Ravel, Bartek, Harris, Milhaud, so they will appeal to other modern writers.

In the early years of this century, the musical world began to explore new and varied horizons. In these years the musical public saw attempts at polyrhythm (music of different rhythms played against each other), at polytonality (mixed keys i. e. melody and harmony were placed in different keys) or just plain atonality (a luscious method in which the concept of keys was thrown out the window altogether.) In Milan, Russolo proclaimed the end of Apollo and the beginning of the reign of Vulcan. "Noise is triumphant," he cried. "We are satiated with Beethoven. We derive greater pleasure from combining the noises of street-cars, internal combustion engines, and automobiles."

This movement, this feeling of desire for new forms was felt on the popular level as well. Change had to come, and it appeared in the agitating strains of ragtime, which made the dance floor a national institution. Jazz is usually thought of as the child of ragtime. This is incorrect, although they had a common ancestry. However, a glance at ragtime is rather interesting. The first ragtime smash hit was Kerry Mill's *Georgia Camp Meetin'*, which came out in 1897. In 1899, Scott Joplin wrote *The Maple Leaf Rag*. In 1911 *Alexander's Ragtime Band* appeared and swept

(Continued on page 40)

LEUKEMIA

VICTOR LEVINE, M.D.

Professor of Pathology, The Chicago Medical School

Leukemia, by the most simple definition, is a condition in which there is a greatly increased number of white cells in the blood. In fact, the term leukemia, coined by Virchow in 1845, merely means white blood.

At the start of the usage of the term leukemia in 1845, it became apparent that there is more than one kind of leukemia. The case that Virchow described in 1845 was apparently a myelogenous leukemia while Bennett, an Englishman, independently described in 1845 a case which probably was a lymphatic leukemia.

The white cells of the circulating blood are formed in the blood forming organs. In the embryo practically all tissues in the body form blood cells. By middle fetal life this function has been restricted to the bone marrow, lymph nodes, liver and spleen. These four organ groups constitute what are usually called the blood forming organs. By the end of the prenatal period, and even in postnatal existence the formation of white cells is limited to the bone marrow and lymph nodes. Under certain abnormal conditions, such as leukemia, it is common, however, for the liver and spleen to revert to their original fetal function of forming blood cells.

When a blood count is made and an increase of cells is found this merely means that the bone marrow is producing more cells than normal. In other words, the circulating blood is just a measure of what is tak-

ing place in the blood forming organs. This is especially true in leukemia.

With this fact in mind the first simple definitions must be revised. It becomes, then, a condition in which there is an abnormal, excessive hyperplasia of white cells in the blood forming organs. The excess of white cells is usually passed into the blood, producing a high white blood count.

If it is remembered that there are three different types of white blood cells usually seen in the blood it can be understood why there may be different types of

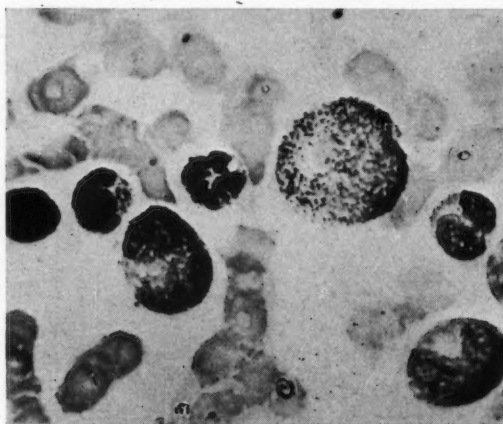


Figure 2. Blood smear from a case of chronic myelogenous leukemia, high power. This is from the same smear as figure 1 and illustrates the large number of immature cells of the myelogenous (leukocytic) series.

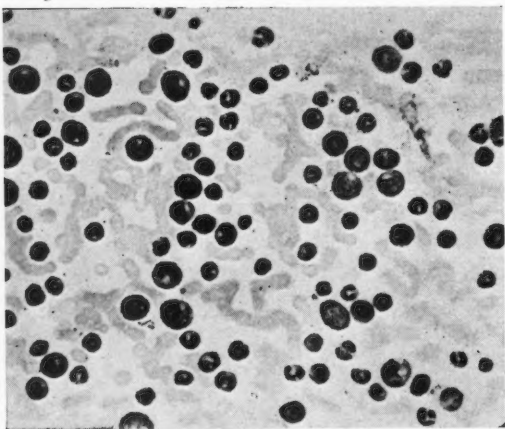


Figure 1. Blood smear from a case of chronic myelogenous leukemia, low power. This illustrates the tremendous number of white cells seen in the usual case.

leukemia. If lymphocytes are produced excessively, there exists what is called *lymphatic leukemia*. If the monocytic series of cells happens to be the offender, the resulting leukemia is called *monocytic leukemia*. If the myelocytic series of cells is the one which proliferates excessively, producing large numbers of leukocytes (or granulocytes), the leukemia might be called leukocytic or granulocytic but happens to be called *myelogenous leukemia*. It will be of some value to remember that the older name for this last mentioned type was spleno-myelogenous leukemia, a term which is still of some value from the clinical point of view.

In addition to the above mentioned three types of

leukemia there are some other rarer types which are not mentioned here. Leukemia must be further subdivided on a clinical basis into acute and chronic

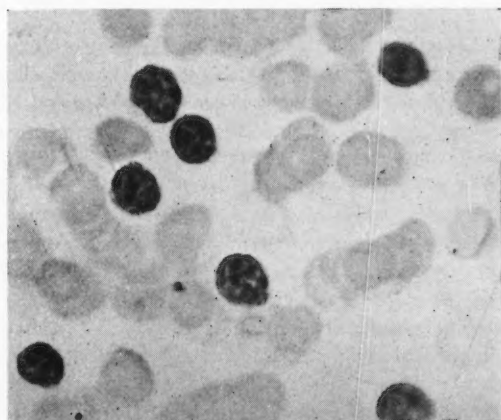


Figure 3. Blood smear from a case of chronic lymphatic leukemia, high power. The excess number of white cells here can be seen to be of the lymphatic series, in contrast to the cells seen in figure 2.

forms. Theoretically, all three types can appear as either the acute or chronic form, but there is some question as to whether there are authentic cases of chronic monocytic leukemia.

Let us first consider the clinical features of *chronic leukemia*. The course may run a number of months or several years. The patient usually complains of weakness and fatigue. Sometimes there are no definite subjective complaints and the condition is discovered accidentally in one of a number of ways. A routine or incidental blood count may disclose a high white blood cell count. A general examination may reveal an enlarged spleen or enlarged lymph nodes. Sometimes, of course, the patient may notice these enlargements and come to a physician complaining of them.

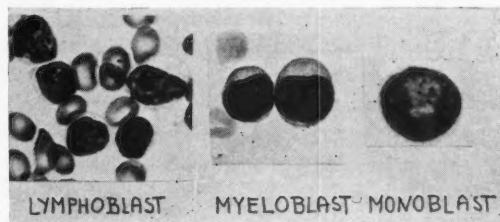


Figure 4. Oil immersion microphotographs ($\times 1200$) of the three most immature cells of the different white cell series, the lymphoblast, myeloblast and monoblast (from left to right). Note that there are distinct differences in these three different cells.

The enlargement of the spleen is most apt to be greatest in the myelogenous type where it may reach 2000 grams (normal 150 grams), and fill half of the abdomen, but there is no absolute rule about this. Lymph node enlargement, when it occurs, is usually uniform and diffuse; it is most apt to be greatest in lymphatic leukemia, but here again the findings may be variable. In fact, occasionally little lymph node or splenic enlargement may be present, or both may be completely absent from a definite leukemia. This occurs, no doubt, to make more trouble for the medical profession, since it makes the diagnosis more difficult.

In chronic leukemia the blood count may rise to dizzy heights. The author has several times seen patients with a white blood cell count of over one million. With this rise of white blood cells there is usually a moderate anemia, with about 60% hemoglobin and 3,500,000 red blood cells. Occasionally (especially terminally), the red blood cell count may drop more, and some of the patients just mentioned

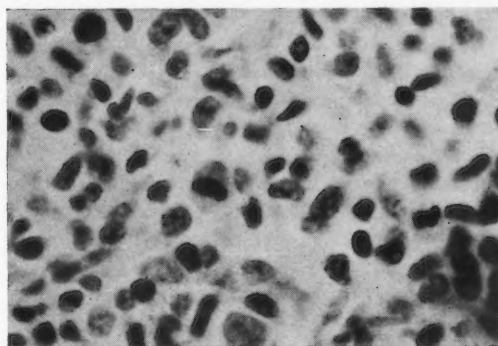


Figure 5. High power microphotograph of a section from the bone marrow in a case of leukemia. Note that the usual fatty structure of the bone marrow has been replaced by a marked hyperplasia of immature blood forming cells. Note also the mitotic figure which indicates a marked degree of hyperplasia.

had a red blood cell count below a million. Such a patient has more white blood cells than red blood cells and really has the "white blood" of Virchow.

However, very high white blood cell counts as just mentioned are the exception. In chronic myelogenous leukemia (often called chronic myelosis) the white blood cell count usually varies from 50,000 to 200,000. In chronic lymphatic leukemia (often spoken of as chronic lymphadenosis) the white blood cell count usually ranges from 30,000 to 100,000.

At autopsy, a case of chronic leukemia will usually

(Continued on page 34)

THE TREATMENT OF CORONARY THROMBOSIS

MICHAEL SACKS

Coronary thrombosis is the obstruction, usually acute, of a branch of one of the coronary arteries, resulting in infarction and death of the affected heart muscle supplied by the occluded vessel. It occurs most frequently between the ages of fifty and seventy, and rarely under forty. It is two to three times as common in men as in women.

Coronary arteriosclerosis is the commonest cause of cardiac infarction, with arterial hypertension and diabetes frequently associated as precursors. Coronary thrombosis is especially common in persons who have had the anginal syndrome. Syphilis and bacterial infections occasionally cause the condition. Recent studies emphasize the frequency of arteritis in all sorts of infectious diseases in cases of myocardial infarction. Other causes include periarteritis nodosa, and, rarely, coronary embolism.

The obstruction is almost always due to a combination of progressive narrowing of the coronary lumen and the development of a thrombus which blocks the lumen. If a large branch becomes blocked suddenly, death occurs in a brief space of time. If the blocking occurs more gradually, or not so large a branch is blocked, characteristic symptoms may occur, with death ensuing in a few hours or a few days—usually within two weeks, sometimes longer. On the other hand, there may be recovery from all symptoms, depending upon the rapidity of the blocking, size of the involved artery, its previous condition, and the integrity of the cardiac musculature and mechanism. If blocking takes place gradually, a compensatory anastomatic circulation often develops, which is functionally efficient, and prevents any symptoms or no more than the symptoms of angina pectoris.

The left coronary, or its anterior descending branch, is the vessel most often occluded. The obstruction produces an anemic infarct of the heart, generally in the anterior apical portion of the left ventricle, or posteriorly near the base of the left ventricle and the intraventricular septum. The coronaries are not strictly end arteries, but their anastomoses are usually inadequate to assume the function of a large branch such as the descending ramus.

Prior to the obstruction, the pathological process in the vessel wall may have narrowed the lumen gradually so that the final obstruction takes place in a vessel of very small calibre. The obstruction itself often

takes place suddenly, blood clotting being a factor along with edema and possible extrusion of cells. The gradual narrowing of the lumen does two things. It allows time for collateral circulation to develop from some other coronary artery through the gradual dilatation of small anastomosing vessels and the veins of Thebesius, and it also leads to degenerative changes in the heart muscle of the vascular territory with secondary fibrosis, thus reducing the cardiac reserve of the heart.

The infarcted area undergoes necrosis with liquification and absorption. Healing takes place by the invasion of connective tissue and the formation of a scar. The heart may rupture at the site of the infarct, the scar which develops having stretched and formed a cardiac aneurysm, or healing may be complete with the formation of a firm cicatrix. In any case, the process leads to a further encroachment on the cardiac potential.

The initial symptom is substernal pain which is ordinarily severe but may vary considerably in intensity. The pain is spontaneous and commonly persists for hours and even days. This pain is not relieved by nitrites. Nausea and vomiting may accompany the pain or may follow shortly after its onset. There may be symptoms of shock and collapse, especially in the severer cases. The symptoms of shock and collapse may be the only ones present or there may be evidences of acute pulmonary congestion or of pulmonary edema. Fishberg feels that myocardial infarction is very closely associated with pulmonary congestion but does not seem to be able to explain the exact relationship of the two conditions. A lower fever is usual during the first few days. There is often a moderate leukocytosis with a relative increase in the polynuclear count. The blood pressure generally falls more or less rapidly during the first few hours. The fall may be moderate or marked and the pulse pressure is usually reduced.

The heart may show some enlargement. The systole is very feeble, and often the apex impulse can be neither seen nor felt. The rate is generally rapid and there is frequently some arrhythmia present. When the infarction involves the upper part of the septum, heart block may be present and the rate be very slow. The heart sounds usually are quite feeble, especially the first sound as heard at the apex. Gallop rhythm is present in many cases. Localized pericarditis some-

times develops over the infarct as evidenced by a fleeting friction rub which may sometimes be present. Cardiac infarction may also give rise to other cardiac irregularities including auricular flutter or fibrillation, tachycardia, and other arrhythmias.

In myocardial infarction, mural thrombosis may occur over the infarct within the ventricle and give rise to embolism in various organs of the body. We may also see paroxysmal auricular fibrillation. It should be suspected if the heart rate jumps to a level above 160 and the rhythm remains essentially regular. Another possibility is ventricular fibrillation which may occur with the auricular fibrillation or may occur independently. This generally causes immediate death.

When the patient lives for more than four or five days to a week following the attack of coronary thrombosis, recovery is likely to ensue. If an attack is recovered from, prognosis obviously depends in part on the evidence found of subsequent cardiac failure. This recovery may be so incomplete that the patient remains bedridden and within a few weeks or a month develops a progressive heart failure leading to death. H. W. Rathe has demonstrated by means of an extensive survey that prognosis as to recovery from a particular attack can be approximated by careful examination of the individual case. A good prognosis was indicated if the patient was under 55 years of age, the heart rate did not reach 100 or dropped within two or three days to 90 or less, the blood pressure returned to a near normal level, the heart was not enlarged, and there were no signs of cardiac insufficiency. The patient in whom these good prognostic signs predominate should live many years if carefully managed. This management will be discussed under treatment.

Recovery may be complete or in other cases may only be enough to allow the patient to lead a greatly restricted life for a few years. Less than 30% of first attacks are fatal.

The treatment of coronary thrombosis may be divided into three large categories.

- I. Immediate management of the acute attack.
- II. The management of the convalescent stage.
- III. The subsequent management of the patient for the prevention of cardiac embarrassment and possible failure.

The mainstay in the treatment of acute coronary thrombosis is the reduction to an absolute minimum of the demands on the heart. To this end the patient is kept strictly in bed and is not permitted to lift a finger unnecessarily. In the vast majority of the cases, pain is the chief complaint. The accepted method, until recently unquestioned, has been the administra-

tion of morphine in doses large enough to relieve the pain. However, there is mounting evidence that the use of morphine alone may be dangerous. It has been shown that the sudden death of a patient with infarction of the myocardium is due to a reflex coronary vasoconstriction whose stimulus is the infarct, whose afferent pathway is the cardiosensory innervation and whose efferent pathway is the vagus. The result of this reflex vasoconstriction in a susceptible person is fatal ventricular fibrillation. Morphine has been shown to stimulate the vagus and, therefore, the possibility exists that the use of this drug in severe cases of coronary thrombosis may serve to increase the possibilities of ventricular fibrillation. It has, therefore, been recommended that attenuation of the vagus vasoconstriction mechanism be attempted by the use of atropine. Thus the use of atropine and morphine jointly is becoming more widely accepted than the use of morphine alone.

Sedation is extremely important and fulfills the two functions of minimizing activity and tending to diminish harmful reflexes. Once the initial pain has subsided, the morphine should be replaced by milder sedatives. The pain relieving qualities of papaverine hydrochloride along with its recently demonstrated antifibrillation and powerful coronary dilator effect has brought this drug to the fore in the treatment of coronary thrombosis. The protection of uninvolved areas of the myocardium from the vasoconstrictive reflexes which might either extend the area of infarction or induce ventricular fibrillation serves as the rationale for the use of this drug. Elek and Katz urge the use of larger doses of papaverine than has heretofore been attempted. There appear to be no contraindications to its use intravenously except possibly in complete auriculoventricular block.

Nitroglycerin has no effect on the pain of coronary thrombosis and with the lowered blood pressure seems to be contraindicated because it may serve to enhance the picture of shock by causing further peripheral vasodilatation.

Digitalis, it is generally felt, should not be used in coronary thrombosis unless there is heart failure which has not responded to any other treatment. There are three principal reasons for this. First, digitalis increases myocardial irritability. Consequently, a dangerous or fatal ectopic rhythm may result from a further increase of myocardial irritability in a heart which already has an abnormally irritable focus in the areas of infarction. Secondly, digitalis increases the strength of the cardiac contraction. This would in-

(Continued on page 38)

THE EFFECT OF CRYPTORCHIDISM UPON TESTICULAR FUNCTION

JEROME GOLDFLIES

It has been known for a long time that the testes are in some way responsible for the appearance of the secondary sex characters and modifications in the state of the internal accessory reproductive organs in the male. Two functions have been assigned to the testes; a primary one, germ cell production, and a secondary one, that of hormone production. The primary function, germ cell production, is characteristic of both invertebrate and vertebrate animals; hormone production, however, is characteristic of the vertebrates.

A question of much debate, since experimental work in the direction of testicular function was started, has been, which part of the testis is responsible for the production of the endocrine secretion?

It is now generally accepted that the interstitial cells of the testis are responsible for the hormone production, and the Sertoli cells of the seminiferous tubules act as nurse cells for the germinal element present, providing the mechanism for the growth and development of germ cells.

One of the outstanding characteristics that distinguishes mammals from other animals is the presence of abdominal testes which, in the majority of mammals, pass into a scrotal pouch. Sometimes there is a retention of one or both testes in the abdomen, resulting in the condition known as cryptorchidism. If one testis remains in the abdomen, then the scrotal testis is capable of producing a sufficient number of germ cells necessary for reproduction purposes, while the abdominal one never produces spermatozoa. When both testes fail to descend into the scrotum, sterility results.

The scrotum acts as a temperature-regulating mechanism, containing the dartos muscle, which expands in warm temperatures and contracts in cold temperatures. The value of this mechanism is substantiated by numerous experiments which have shown its use. It has been known for a long time that the application of heat causes testicular degeneration. In experiments where the scrotum was insulated, the testis degenerated. Similarly, when the scrota of guinea pigs were suspended in water 5-6° higher than the normal scrotal temperature, testicular destruction resulted. Sheep herders have known for a long time that the insulation of the testes (scrotum) prevented breeding. They used leather sacs.

Heller (1929) found that sperm in the epididymis

will live 65 days when the epididymis is in the scrotum, but will live only 14 days when it is in the body cavity.

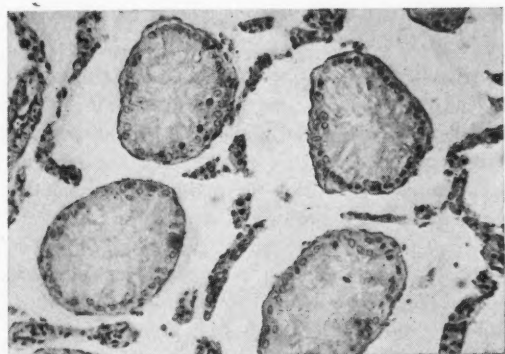
Moore and Quick showed that the temperature on the inside of the scrotum is decidedly lower than that of the peritoneal cavity at the same moment. They concluded that seminiferous tubule degeneration in cryptorchid testes, natural or experimental, was due to the effects of an abnormally high peritoneal cavity temperature as compared with that of the scrotum or the normal environmental temperature for the testes. Also, the difference in the temperature of the two cavities varies as the external environmental temperature varies.

Sand (1921), and Moore (1924) found that experimental cryptorchidism or surgical replacement of the testes in the abdomen caused the occurrence of many important events. They found that if an adult guinea pig testis was elevated into the abdomen, a marked disorganization of the seminiferous tubules took place during seven days of abdominal confinement. It was found that the germinal epithelium was changed, cytolysis and fragmentation were evident, and the lumina of the tubules were filled with debris. As time progressed, it was found that the cells of the germinal line almost completely disappeared after a lapse of two months. After several months the seminiferous tubules were reduced to a fraction of their original diameter, and they contained only Sertoli cells.

Moore (1926) observed the activity of displaced testes and its bearing on the problem of the function of the scrotum. Testes of the rat and guinea pig were removed from the scrotum to a subcutaneous location. He found that such testes were able to continue their spermatogenetic function from three to nine months, but no spermatozoa were formed. He also found that the partner to the subcutaneous testis that had been located in the abdomen for a similar length of time did not carry on its spermatogenetic function. His conclusions were: (1) the conditions regulating this condition are external rather than internal and are considered to be an effect of the environment; (2) temperature regulation is necessary for the primary function of the testis; and (3) the function of the scrotum is to act as a heat regulating mechanism necessary for the production of spermatozoa.

Lawrence (1926) experimented with guinea pigs to determine the fate of the germinal epithelium of experimental cryptorchid testis. He found that when the testes of sexually mature male guinea pigs were elevated to, and allowed to remain in, the abdominal cavity, a progressive desquamation and degeneration of the germinal epithelium took place; at six days abdominal retention degeneration was well marked, at ten days well advanced, and at twenty days practically all epithelium was removed. This degeneration was attributed directly to the increased temperature of the abdominal cavity over that of the scrotum.

Lawrence determined that neither the speed nor the nature of the degenerative process was affected by ligation of the ductus deferens of the cryptorchid testis. It was found that all of the degenerating elements from the seminiferous tubules were absorbed



Photomicrograph of cryptorchid testicular tissue, showing the effect of cryptorchidism upon the seminiferous tubules, from an adult male white rat.

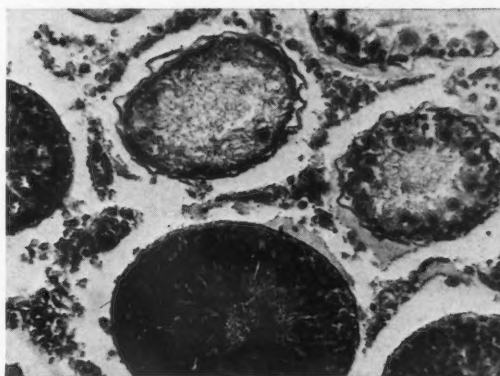
in the testis proper, or were carried to the epididymis where they were absorbed along with the greater part of the spermatozoa which were present at the time the testis was elevated to the abdominal cavity. From this Lawrence determined that absorption of the germinal epithelium from a cryptorchid testis into the blood stream does not affect the integrity of the scrotally-retained normal testis.

Lawrence also found that venous stasis, through ligation of the internal spermatic vein, of testes allowed to remain in the scrotum did not produce the degeneration complex seen in the testes retained in the abdominal cavity.

One of the problems in experimental cryptorchidism has been the effect of scrotal replacement upon the cryptorchid testis. This problem has received much attention due to its application.

Oslund (1926) studied natural cryptorchid testes of man, dog, pig, and sheep with reference to their spermatogenic powers and testicular production. He found that the cells in the seminiferous tubules of cryptorchid testes were active and produced other cells. These cells formed a second incomplete row of cells or pushed centralward in the tubules. He found that some of the cells resembled primitive spermatogonia. These cells produced spermatogonia in cryptorchid testes which showed spermatogenic activity after placement in the scrotum. He concluded, therefore, that germ cells are present in natural cryptorchid testes and that these cells are not only potentially active but actually undergo division. From this it follows that these active germ cells should produce active sperm following surgical transfer to the scrotum. Concerning hormone production in these testes, he concluded that it is produced during the absence of mature spermatogonia, spermatozoa, spermatids, and spermatocytes.

Moore (1926) reached the following conclusions concerning the effect of scrotal replacement of cryptorchid testes; the testis does not recover its normal condition as long as it remains in the abdomen, but replacement in the scrotum after pronounced degeneration has been followed by recovery of its spermatogenetic activity; testes of young guinea pigs replaced in the abdomen before the period of germ cell production, have been returned to the scrotum five and six months later with the appearance of



Photomicrograph of testicular tissue taken from a testis replaced in the scrotum after a period of cryptorchidism experimentally produced. Note regeneration of germinal epithelium and general recovery of the normal appearance of the seminiferous tubules. Testis from an adult male white rat.

(Continued on page 35)

OBSTETRICS CLINIC and HOME DELIVERY SERVICE

B. TUMARKIN, H. LESSER, M. LERNER

A war is being fought in Chicago today! There is no general clamor, no outcry. We who have rallied under the guidon of Aesculapius fight a battle against an "older Axis"—maternal and fetal mortality. We have gained a partial victory, but the battle is not yet won. The struggle will not end here.

In this sense and to this end the Chicago Free Dispensary dedicated its Obstetrics and Postnatal Clinic a few short years ago. That its efforts may not go unsung we give you these words and views.

It will generally be admitted, the keynote to further reduction in maternal and fetal death rates lies in the prenatal care which is thorough and efficient. The test of labor requires preparation equal to that of any major surgical procedure. In our clinic, therefore, a basic plan of procedure is followed. Clinicians, students, and patients have learned to know its merits well. Essentially it consists of:

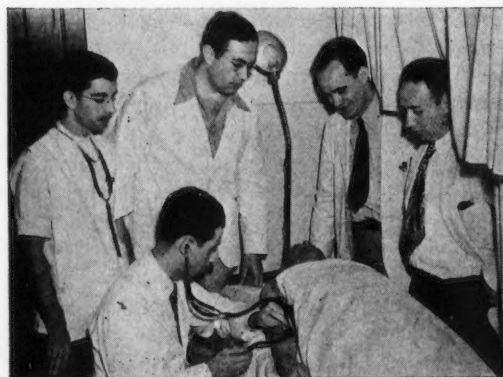
1. Social service interview to determine the social, economic, and family status of the presenting patient which will have a bearing on treatment in the clinic.
2. Preclinical examination.
 - a. history
 - b. physical examination
 - c. laboratory examinations consisting of blood tests and urinalysis.
3. Obstetrical Clinic.

Upon admission to the Obstetrical Clinic, the menstrual history and the previous obstetrical history of the patient is taken. The clinician in charge then proceeds to examine the patient in order to rule in or rule out pregnancy on a clinical basis. The diagnosis of the doctor is then corroborated by laboratory examination, namely the Ascheim-Zondek test. When the diagnosis of pregnancy is established, the doctor takes the patient's pelvic measurements and records the height of the fundus of the uterus. At that time the patient is weighed, her blood pressure is taken, and her temperature is taken, and all these are recorded on her chart for further reference. Before she ends her first visit

to the Obstetrical Clinic she is instructed as to her diet, the proper clothing to wear, and how to regulate her ordinary daily activities. She is given instructions in female hygiene and the care of her body. Whatever social and sexual problems she may have are clarified for her. The Social Service is occasionally consulted for interpretation to the patient, and when the end of gestation draws near, aids the patient in preparing for Home Delivery.

After her first visit to the Obstetrical Clinic the patient returns to the Clinic for regular routine examinations. During the early months of pregnancy she returns once a month, unless she feels she requires attention sooner. During the mid-pregnancy months she returns every two weeks, and during the last month of pregnancy she returns every week till she is ready to deliver. During each of these visits her weight, blood pressure, and temperature are recorded and her progress is followed. Each time she visits the Clinic she brings a specimen for urinalysis. In this way close check is kept of the patient so that any abnormalities are immediately detected and treated.

On her final visits to the Clinic before she expects to deliver the patient is instructed in the method of preparing her home for the coming event. She is required to hold in readiness a carefully prepared set

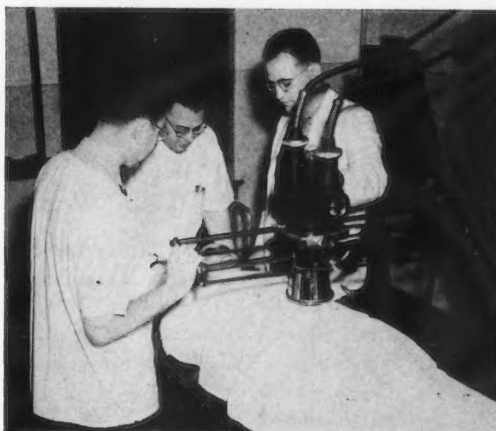


of necessary facilities, and when the proper time comes to call the doctor in charge of her case. Shortly thereafter the assigned team of trained medical students will arrive bearing the necessary equipment for the delivery. They do not leave the patient till the delivery is completed, and it is their duty to inform the clinician in charge of the progress of the labor at regular intervals and to call him as needed. When the clinician arrives, he does the delivery and the students assist him.

After the child has been delivered and has been properly cared for, and after the mother has been properly treated and made comfortable, she then requires a period of rest, called the postpartum period. During this period the students who are assigned to the case pay daily visits to the patient for several days and report in writing the progress of the mother and child.

If the delivery has been normal and uneventful and the postpartum period has been normal, the mother is instructed to return to the Clinic six weeks after the delivery of her child for a final examination. At this visit the state of the mother's health and the condition of her internal organs are noted. If it is found

(Continued on page 24)



Prenatal examination of prospective mother showing the taking of blood pressure, an EKG, physical examination, and X-ray. The upper picture shows the infant being examined in the Pediatrics Clinic.



ALUMNI

1900

We sincerely appreciate Raymond G. Olson's complimentary remarks about "The Quarterly," and wish him continued success in his general practise in Muskegon Heights, Mich.

1905

Ernest H. Brandt sends his regards from Cathedral City, Cal.

1907

Dennis A. Bethea is busily engaged in general practice and is on the staff of the St. Margaret Hospital in Hammond, Ind.

1912

F. H. Steinhoff has written to us of his successful general practice.

1915

George E. Kirby is practicing general medicine in Spring Valley, Ill.

C. J. Munch finds refraction his chief field of interest.

1916

Albert Martin has been specializing in tuberculosis since 1916, and recently published an article on graduated exercise in tuberculosis, in the U. S. V. A. Bulletin. Dr. Martin served as a Captain in the 314th Sanitary Train, 89th Division in the last war.

1918

M. L. Morris is in general practice in Pine Bluffs, Wyo.

1922

Paul E. Thal is doing general medicine and surgery.

1925

M. S. Sprigel writes of his successful general practice.

J. J. Anderson is temporarily retired due to illness. We wish him a speedy recovery and hope he will be back at his general practice in the very near future.

A. O. Stephenson is Associate Medical Officer in the Chicago Signal Corps.

1926

Our congratulations to Bruce E. Jackson who recently was commissioned as a captain.

John J. Klein is practicing general medicine in Harrisburg, Ill.

Matthias Marquardt is specializing in neuro-psychiatry in Augusta, Maine.

1928

William T. Gueno is busily engaged in general

practice and is Examining Physician in the Selective Service System in East St. Louis, Ill.

Henry Ruffu's time is occupied in general practice and medical defense.

1929

A. P. Tolentino is practicing general medicine in Chicago.

Capt. W. E. Block, now stationed with the 85th R. C. N. Bn., APO No. 255, Pine Camp, N. Y., writes as that he was recently promoted to captaincy.

1931

Armen Yazarian is in general practice in Peoria, Ill. and informs us that his brother, Capt. Arshak Yazarian, '32 is overseas in the armed services.

1932

Emily Ann Svoboda writes of her specialization in obstetrics and gynecology.

1933

General practice and surgery occupy the interest of L. C. Johnson.

C. O. McCreedy is in general practice in Aledo, Ill.

1934

Andrew Krajec is on the staff of the Clyne Hospital specializing in surgery.

C. G. Kurtz writes of his successful general practice.

Hage Steiniche writes us that he is now in the Army, attached to the 425th Ambulance Battalion, Camp Robinson, Ark.

1935

In addition to his general practice B. C. Kappmeyer has found a hobby in magic and ventriloquism. Recently he was elected to membership in the Society of American Magicians.

A. I. Podolsky is practicing general medicine and surgery, and is also Pediatric Consultant, Maternal and Child Health Division, in Somerton, Arizona.

Andrew J. Nowakowski is busily engaged in medicine and surgery and is the examining physician of Draft Board No. 2 in Elgin.

1936

J. J. Valro is the medical director at a Chicago aircraft assembly plant and has a general practice.

Louis H. Turek is in general practice and is active on the Board of Health and in the Selective Service System.

Dr. Louis Turek writes us a long letter telling us of his many activities, among which are that he is the only examiner for his local draft board, member of Reviewing Board of Examiners set up by Lt. Col.

Hartlett, head of Cook County selective. He has been teaching anatomy for the past 7 years to nurses at South Chicago Hospital. He just had a paper published in the Journal of Gastroenterology.

1937

Captain Charles W. Johnston who formerly practiced in Waverly, Ill. is now in the army.

Lt. Saul Burten writes via V-mail from the Hawaiian Islands how he finally arrived there after having been first at Ft. Lewis, Wash., then at the Mojave Desert, and at Camp Stoneman. During his travels he met Lt. Harold Kass, '37, Lt. Harry Barnett, '40, and Capt. Mike Parkes, '36. He says he corresponds occasionally with Capt. L. H. Weisskopf and A. M. Burke.

1938

Capt. Bernard F. Rosenblum is with the 156th Combat Engineer Battalion, as Battalion Surgeon, at Camp Cooke, Calif.

W. F. Granzig is practicing general medicine at Mount Prospect, Ill.

Lt. George E. Fisher informs us that he is now taking a two-month course in Tropical Medicine at the Walter Reed Hospital, Washington, D. C. He urges his colleagues to take the course, if possible. With him at the Walter Reed Hospital is Capt. Jack Epstein. Lt. Fisher's address is Box 365, Army Medical School, Army Medical Center, Washington, D. C.

1939

Captain Bernard S. Freedman is Battalion Surgeon at the 731st Field Artillery Battalion, at Camp Maxey, Texas. He informs us that his brother, Capt. Adio Freedman '41 is now on maneuvers in Tennessee and is the Neuro-psychiatrist with the 35th Evacuation Hospital there.

Albert M. Rosen writes that his application for medical work in the ski troops has been turned down due to the shortage of physicians in Taos, New Mexico, where he resides.

Frederick G. McKerr, of 74 North Street, Pittsfield, Mass., writes us that he is engaged in private practice, and that, in addition, he is also the city physician and the physician for the General Electric Co.

1940

Albert J. Bartolo has been recently commissioned as a lieutenant.

Morris Rand is an industrial physician and surgeon in Chicago.

Lt. Louis Pertzovsky writes an interesting letter telling us that he received his commission on May 6, 1943, and was sent to the Army School of Roentgenology at Memphis, Tenn. After that he was as-

signed to the Mayo Clinic for a course in advanced roentgenology.

1941

We have just learned that Capt. Samuel I. Guest has recently received his captaincy and that he is at present on maneuvers. Capt. Guest is attached to Co. F, 341st Medical Regt., A. P. O. 402, c/o Postmaster, Nashville, Tenn.

William O. Sweet is enjoying a successful general practice in Chicago and is serving as Resident Physician in obstetrics at the Evangelical Hospital.

Lieut. Charles L. Leach who is stationed at Fort Bliss has been recently promoted to a captain.

1942

Joseph L. Palumbo was married to the former Miss Florine Doty on Aug. 8, 1943.

1943

Alvin Gross writes of his internship at the Illinois Central Hospital at Paducah, Ky.

DEATHS

Dr. Jacob J. Hood, graduate of Jenner College of Medicine, died on May 27, 1943. He is the father of Capt. Jo Rogers Hood, U. S. A. M. C., of the Class of 1936 at the Chicago Medical School.

Dr. George M. Redman, of the Class of 1921 at the Chicago Medical School, passed away on March 27, 1943.

Leonard Mrozowski was killed in action on July 11, 1941. Mr. Mrozowski was formerly a student at the Chicago Medical School, having been in attendance during 1936-1938. He was a member of the Nu Sigma Chi.

Dr. Francis L. Richardson died on June 22, following an illness of several months. For years he had been interested in cancer research, and had done considerable work along this line. Dr. Richardson was a veteran of the last war. He graduated from the Chicago Medical School in 1924, and later took advanced work in Italy.

* * * *

"The Venus of Willendorf, the earliest known sculpture of human figure. A limestone statuette, from the middle Aurignacian period (22000 B. C.) . . . is an example of pathologic obesity; such a female appears to have been the ideal of prehistoric man."

FACULTY NEWS

Capt. William Yacullo, who was advanced to captaincy Aug. 17, 1943, former member of the Department of Dermatology at the Chicago Medical School, is at present serving in the Medical Corps of the U. S. Army, and writes that he is on maneuvers "somewhere in the wilds of Tennessee."

Dr. Eugene Lorant, who was an Assistant in the Department of Dermatology, recently was commissioned as a Lieutenant. Dr. Lorant had been on our faculty since the early part of 1942. He left for Vancouver on July 23.

Dr. Allan S. Shohet, Associate Professor of Medicine, was recently certified by the Board of Internal Medicine.

Capt. Emil Zidek, formerly clinical assistant in the Department of Gynecology, was advanced to captaincy on June 12, 1943. Capt. Zidek is stationed with the 341st Inf. Med. Detach., Camp Howze, Texas, A.P.O. 450.

* * *

Miss Carrie C. Gillaspay is the new assistant in Anatomy. She received the Bachelor of Arts degree at Iowa State Teachers College, and the Master of Science degree in Medical Science at the University of Oklahoma.

She has had several articles printed in the various scientific journals on the myelencephalon gland and its relationships, the meninges of the brain and the facial nucleus of the rat. At the present time she is engaged in study at the Northwestern University for her Ph.D.

Her chief recreation is sports.

* * *

Lila Clara Kaplan is the Clinical Pathology assistant and new clinic laboratory technician. She is a native Chicagoan with all her education having been obtained in the Chicago public schools, following which she attended the University of Illinois. She attended the Cook County Graduate School of Medicine, from which she received her medical technician's diploma. She spent a year at the Cook County Hospital on a medical technician's internship.

Her hospital association previous to Chicago Medical Clinic was with the St. Anthony's Hospital. Also she has had some experience in private physician's offices.

Miss Kaplan's chief hobbies are swimming and tennis.

* * * *

Irrationally held truths may be more harmful than reasoned errors.—Huxley.

SOCIAL NOTES

George P. Dillard, of the Senior Class, and the former Dorothy M. Thorson of Cleveland, were married in Chicago, July 3, 1943.

Dr. MacFarland married the former Alice Zienty, of Chicago, in Evanston on May 8, 1943. Dr. MacFarland is of microanatomy and neuroanatomy at the Chicago Medical School.

Dr. and Mrs. Raphael M. Adelman (he's a senior) celebrated their first wedding anniversary on Aug. 22.

Mr. and Mrs. Herman L. Weisberg (Ye Editor) celebrated their first wedding anniversary on September 5.

Mr. and Mrs. Daniel C. Belden were married one year on June 28.

Mr. and Mrs. Irving N. Agrin celebrated their first wedding anniversary June 28.

Stanley D. Rothman of the Junior Class, announces that the date of his marriage to Miss Edith Mintz, of Chicago, is September 18, 1943. The marriage will take place at the Medinah Club.

ACUTE ANTERIOR POLIOMYELITIS

(Continued from page 7)

ment she advocates. That there is still a great dispute between the advocates of the orthodox method and the advocates of the Kenny method of treatment as to the efficacies of their respective methods is unfortunate, because there can be no denying the excellent results obtained by the use of the Kenny treatment in acute polio.

1. Cole, W. H., Pohl, J. F., and Knapp, M. E.; The Kenny Method of Treatment for Infantile Paralysis. New York, The Nat'l Foundation for Infantile Paralysis, Inc. 1942, 42 pp.
2. Krusen, F. H.; The Kenny Treatment for Poliomyelitis; Med. Clin. of America; July, 1943, p. 883.

OBSTETRICS

(Continued from page 21)

that some damage has been done to the organs during delivery, she is referred to the Gynecological Clinic for further treatment.

At the same time, the newborn infant is given a complete examination and is placed in the care of the Pediatrics Clinic, where all the necessary steps are carried out to insure the health and growth of the new baby. Here the child's nutrition is regulated. It is given the necessary prophylactic injections against whooping cough, diphtheria, and smallpox.

Thus we see how the Chicago Free Dispensary operates in offering its services and its facilities to the mothers of Chicago and the future generations which these mothers bring into the world.



Lester N. Selig

Lester North Selig, one of Chicago's most prominent businessmen, has recently joined the Board of Directors of The Chicago Medical School. Mr. Selig, who is president of the General American Transportation Corporation, was born in Brooklyn, N. Y., on September 10, 1893, the son of Louis N. and Bertha Norden Selig. He received his preliminary education in the public schools of New York, and he attended Boy's High School in Brooklyn. In 1914 he graduated from the Brooklyn Law School and embarked on what turned out to be a very successful career.

Mr. Selig began his career as a workman in the shops of the General American Tank Car Corporation, of which he is now president, in 1914 in Chicago. When the First World War broke, he enlisted as a private in the infantry, and when the war was over he came out a captain. He served with the infantry during the years 1917-1918 and was with the A. E. F. from May 1918 to June 1919.

Not only is Mr. Selig very active in the business world, but he also participates very actively in the social and cultural worlds. He is a member of the Art Institute, and he is a life member of the Chicago chapter of the Phi Alpha Fraternity. He also belongs to various social clubs, among them the Standard Club, the Tavern Club, the Cloud Club, and the Lake

Shore Country Club.

Philanthropy and services to charitable organizations occupy a large part of Mr. Selig's time and effort. He was president of The Jewish Charities of Chicago during the years 1938-1941, and he is at present chairman of the Medical Care Committee of The Jewish Charities of Chicago. Mr. Selig is working very hard to make medical services and facilities available to a large part of the population which does not at present have adequate medical care. Along with this is combined his interest in medical education and his active participation in its administration as a member of the Board of Directors of The Chicago Medical School.

Since the outbreak of the present war Mr. Selig has been outstanding in his contributions to the war effort. He is a member of the Regional War Manpower Commission, and he is serving in the Transportation Equipment Division of the War Production Board.

Mr. Selig is married to the former Helen Montgomery, who became his wife in 1925. They have one daughter, Shirley.

Mr. Selig's interest in medicine stems from many years of work with charitable institutions and with the problems of the poor. The strength of his interest is evidenced by his wide knowledge of the state of medicine both in this country and abroad. That he has given much thought to the problems of the medical world itself and of the health of the nation as a whole is immediately apparent by the views he holds on these subjects. He feels that the day is not far off when adequate medical care will be available to all persons regardless of station in life and ability to pay for medical attention. He believes that the "medical hotels have reached their peak" because of their limited capacity to treat large numbers of patients. The new advancements in techniques, in mechanical devices for treatment and diagnosis are available only to those who can afford to pay for their use, and this he feels is not entirely right. All persons are entitled to receive the benefits of all available medical facilities. The public is being educated about matters of health and is beginning to demand adequate medical attention. He is convinced that such a medical program will be instituted in the near future, whether through the initiative of the medical profession itself or through the medium of government subsidization of medicine.

The views of Mr. Selig on the subject of medical education are in full accord with his views on medicine in general. Medical education, he feels, should be made available to all who desire to study medicine. It should be restricted only in the sense that those chosen

to study medicine be those who have the innate ability and love for medicine and who have the sincere desire to serve for the sake of serving humanity.

It is very fortunate, and a great honor, to have Mr. Selig as a member of our Board of Trustees. It is a rare combination in a man to have a keen business sense and to have as well the delicate feel of the sense of medicine. Such a combination we find in Mr. Selig; and for his feeling of the social sense of medicine, we feel that he "belongs."

Dr. Jay A. Smith, of the Department of Physiology, has, during the few years he has been with us, made several notable contributions in research, laboratory techniques and pedagogy.

After graduating from De Pauw University (A.B., 1936), Dr. Smith continued his studies in the field of Protozoological Physiology at Johns Hopkins University where he received the degree of Ph.D. in 1939. During these three years he held graduate assistantships in General Biology and in Comparative Anatomy at Johns Hopkins. The following year he was appointed Acting Head of the Department of Biology at Springfield College in Massachusetts.

In the fall of 1940, Dr. Smith joined the faculty at C. M. S., securing as Head of the Physiology Laboratory and as lecturer in special subjects in Physiology. That Dr. Smith's interests have not been confined solely to teaching is reflected in the varied character of his research. This has included such diversified topics



Here Dr. Smith applies the film touch to a few prints; this removes the water from the prints, and allows them to dry rapidly on the print dryer, giving them the necessary glossy finish. An all purpose washer, built out of odds and ends by Dr. Smith, is shown at the left. This washer is a stationary fixture, and will wash prints and all types of film in minimum time.



Dr. Smith makes some necessary adjustments on a movie projector in preparation for making a still black-and-white print from the movie film, using a method he has developed.

as sex-inversion in molluscs and the use of synthetic resins in micro-technique. In recent years, Dr. Smith has lent his talents to the development of several aids to visual education. Outstanding among these are two motion-picture films produced with coöperation of students: "Routine Preparations for Laboratory Experiments" and "Elementary Anaesthesia." These films provide the student with an excellent introduction to surgical procedures in the laboratory.

Dr. Smith's interests in photography have led to the building, at the C. M. S. Workshop, of such instruments as editor-splicer, film-dryer, print-washer, and print-dryer, in which he has incorporated many original designs. He has also devised an improved method for making black and white prints from motion-picture films, using an ordinary projector as enlarger. Among the many pieces of physiological laboratory equipment designed and built by Dr. Smith, are an improved Ergograph and a Color-Mixer.[®]

Dr. Smith's chief hobby is his family which includes a charming wife and a daughter, aged one. In rare moments of leisure he delights in sailing his 15-foot sailboat, "Forever Anonymous."

* * * *

Dyspepsy is the ruin of most things: empires, expeditions, and everything else.—Thomas De Quincey.

ORGANIZATIONS

A. I. M. S.

The Chicago Medical School Chapter of the Association of Internes and Medical Students has resumed activity following a period of inactivity caused by the let-down subsequent to the great activity which went on at the time of the beginning of the war regarding the status of medical students during wartime, particularly students of C. M. S. The school chapter has embarked on its own program, and at the time of this writing, is actively engaged in furthering the interests of the school and in presenting an educational and practical cultural program to the student body.

The position of the C. M. S. Chapter of the A. I. M. S. is reflected in the National Recommendations which emphasize equality and non-discrimination of sex, race, creed, or color in the fulfillment of the Government Training Program for Medical Students, and the inclusion of all medical schools in the overall plan. To date the success of the recommendations has not been general, and since that part which has been noted does not affect us, it becomes evident that there is still much to be done to achieve full adoption of the A. I. M. S. program, and, thus, the inclusion of our facilities in the Training Program.

A series of obstetrical movies produced at the Chicago Lying-In Hospital under the personal supervision of the late Dr. William De Lee will occupy the greater part of the program for the next few months. The first film, "The Normal Physiology of Labor and Delivery," has already been shown.

This Chapter has been noted for its active participation in the war effort, as indicated by its enrollment as Red Cross blood donors. An en masse march was made to Red Cross Blood Donor Headquarters in Chicago where the full staff was occupied for a full afternoon with drawing blood from the students of The Chicago Medical School. The purchase of stamps and war bonds by the students goes on as usual.

The officers of the C. M. S. Chapter of the A. I. M. S. are: A. B. Sincoff, President; M. Vainder, Vice-President; K. M. Calhoun, Secretary, and V. Sarley, Treasurer.

PHI LAMBDA KAPPA

The Alpha Rho Chapter of Phi Lambda Kappa Fraternity has taken to wide and varied activities during the past few months, under the guidance of Dr. Jacob Brodsky.

Dr. Harry Cooper, of the surgery department, and Dr. Samuel Taub, Professor of Medicine, were initiated as faculty members; at this same meeting, Dr. Samuel Schwied gave an interesting and amusing discourse on his school days.

On July 11th, the chapter welcomed the incoming freshman, at the Sherman Hotel with its annual smoker. Twenty-two men have been pledged, they are: Leo Ascher, Stanley Beckerman, Charles Biren, Lou Cholden, Arthur Dishman, Murray Feldman, Elmer Fischerman, Al Geller, Allen Hoffman, Edward Jaffe, Sid Maletz, Mel Morrel, Eugene Plous, Lou Polskin, Paul Prager, Jerry Rabinowitz, Bernard Reizner, Gene Rosenfeld, Bernard Schulman, Harold Snitkoff, Milton Wohl, and Lester Wolff.

On Wednesday, July 28th, Dr. William S. Hoffman, Professor of Chemistry and Medicine, spoke on "The History of the Sulfa Drugs" at the monthly dinner meeting.

Late in July, an informal dance was held at the Illinois Student Union in conjunction with the Alpha Alpha chapter at the University of Illinois. On August 28th, a beach party was held at the North Avenue Beach at which refreshments were served and a grand time was had by all.

"The studies of Peyron on the Greek papyri in the British Museum show that circumcision of girls also was in general use in Egypt. . . . The circumcision of girls consisted in excision of the prepuce of the clitoris."

* * * *

In 1875 Prunières and Brocard were the first to show that many millenia before our historic period, in the Neolithic period, trephining of the skull was frequently carried out—the most ancient operation of which we have objective evidence.

* * * *

CHAS. P. BAUDELAIRE (1821-1867)

Baudelaire was a life-long sufferer from complex nervous disorders. This is reflected in some of his writings, which, however, retain the innate beauty of his poetic genius. Baudelaire sought escape in hasbeesh debaucheries, in alcohol and opium. In 1866, while showing cathedral sculptures to friends, he suddenly fell. He pretended that his foot had slipped, but it was a brief attack symptomatic of the aphasia and hemiplegia which resulted in his death little over a year later.

VARICOSE VEINS

(Continued from page 12)

to three inches of vein. It is well, though not absolutely necessary, to perform a preliminary sensitization test injecting one-tenth of one c.c. intradermally, as some individuals are sensitive to the solution. If the varices are at all extensive, and especially if they occur above the knee, it is the impression of the author that the injection treatment alone will give poor results, since the continuous backflow of blood in the long saphenous vein tends to wash out the chemical thrombi before they can become organized. In all such cases, the patient must be impressed with the fact that a saphenous vein ligation and excision must be done if a good result is to be obtained.

After determining that no contra-indications exist, the patient is hospitalized, and under local anaesthesia a unilateral or bilateral, as the case may be, ligation is done. This should preferably be done in a hospital to insure a proper aseptic field. The incision is made parallel to and two finger-breadths below the middle of Poupart's ligament. The incision is carried down through the fatty tissue and the saphenous vein identified. The ligation must be done as close to the sapheno-femoral junction as possible, so as to prevent a reflux of blood from the collateral branches the superficial external pudendal, superficial external iliac, and the superficial external femoral. A double ligature of silk is placed around the saphenous vein close to the fossa ovalis. The vein is freed from the surrounding fat for a distance of approximately two inches, and a second ligature is placed two inches distal to the first. The intervening segment of vein is cut away. A No. 8 or 10 French rubber catheter is introduced into the distal end of the vein and passed downward for a distance of 8 to 10 inches. Thirty to fifty c.c. of sclerosing solution, depending upon the size of the varices, is injected through the catheter by means of a Luer syringe. The catheter is gradually withdrawn as the injection is made. After the catheter is withdrawn, the distal ligature is tied, the fatty tissue closed with one or two interrupted sutures, and the skin is closed with three or four interrupted black silk sutures. An elastic bandage is wrapped around the leg from the toes to the upper thigh immediately after the completion of the operation, and is left in place for several days. The patient is forced to walk about for several short periods the first day, and is encouraged to become ambulatory as soon thereafter as his condition permits.

It is well, before beginning the operation, to deter-

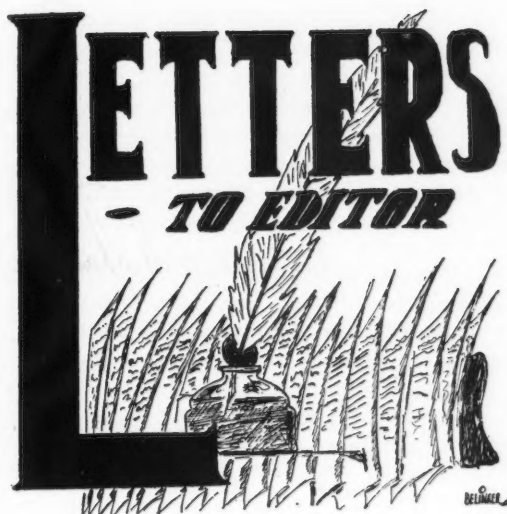
mine whether or not there are any incompetent communicating veins, so that they may be treated at the same time. This may be done as follows: The leg is elevated so as to drain the blood from the varices, and an Ace elastic bandage is wrapped around the leg, starting at the toes, and extending up the thigh close to the fossa ovalis. Then, with the patient standing on a table or chair, the bandage is unwrapped, starting at the toes. At any point where there is an incompetent communicating vein, a tell-tale "blowout" of the superficial vein will occur. This "blowout" is marked with ink or a skin pencil, and the unwrapping of the entire bandage is continued, each successive "blowout" being similarly marked. During the ensuing operative procedure, at the conclusion of the saphenous vein ligation, each of the marked areas is infiltrated with a small amount of 1% procaine, a small skin incision is made exposing the communicating vein, and each of the communicating veins is ligated with silk and cut. This treatment will definitely preclude a reflux of blood from the deep veins into the superficial system. The author has tried, in a few cases, the alternative of not ligating these "blowouts," merely injecting them with 5% sodium morhuate a few days after the vein ligation, and the results have been startlingly good. Should injection of these areas fail, these communicating veins can always be ligated and cut under local anaesthesia at a later date.

The question is often asked as to how many injections into the varicose veins must be given after the vein ligation and retrograde injection of sodium morhuate at the time of operation. No specific answer can be given to this question, as each patient presents an individual problem. One of the author's worst cases of varicose veins was a woman of 57, whose legs looked like the "proverbial road map," required no injections whatsoever after the ligation and retrograde injection. Within a short time, complete thrombosis of the entire long saphenous vein, extending down to the foot, occurred from the one injection. We are not always so fortunate, however, and most patients will require from four to six injections into individual varicose segments post-operatively. It is my belief that one may, and should, wait at least two weeks following the vein ligation and retrograde injection before beginning post-operative injections. Many varicose segments, apparently containing fluid blood shortly after the operation, will, within two weeks, show evidence of an organizing thrombus. Nothing is lost by the short waiting period, and the patient may

(Continued on page 29)

LETTERS

- TO EDITOR



Editor:

I have enjoyed receiving the Quarterly during the past three years, and have witnessed its rightful graduation from infancy to full maturity. It is superior to many other school periodicals I have seen. I hope that this magazine is following our boys in service wherever they might be, and is helping to keep them in touch with the school.

In view of the popularity of the Chicago Medical School Quarterly, I for one, look forward to the time when we will have a Chicago Medical School Monthly. Long live Chicago Medical School and may her banner ever wave.

Jacque R. Chalfin, M.D., '35.

IMPORTANT DRUGS

In a recent survey conducted by Dr. C. P. Kraatz, Department of Pharmacology, in the Senior Class, it was voted that the following are the ten most important drugs in medicine in the collective opinion of the Senior Class. In order of their importance, they are:

1. Sulfa drugs.
2. General anaesthetics.
3. Opiates.
4. Digitalis.
5. Antispasmodics.
6. Local anaesthetics.
7. Analgesic antipyretics.
8. Hypnotics.
9. Autonomic drugs.
10. Cathartics.

THE QUARTERLY

VARICOSE VEINS

(Continued from page 28)

be spared the inconvenience and discomfort of the additional injections.

The small "spider burst" and "rocket bursts" often pose a problem. Many women desire treatment because of their cosmetic disfiguring appearance, especially if these "bursts" are below or about the knee. They are difficult to get into for injection because of their exceedingly small size, even though the finest gauge needle is used. Often we are successful only in producing a beautiful hematoma or a tissue slough. It has been my practice to discourage treatment of these very small varices, unless they occur in conjunction with larger ones. The best plan of attack upon these "bursts" is to enter the feeder vein at a higher level, and make a retrograde injection.

The treatment of varicose veins is becoming increasingly popular as more surgeons familiarize themselves with this simple technique. It does require a little time and patience to master the technique, and none of us should consider this sort of "minor surgery" as being beneath our dignity. "Little things, done well," add up to big things. A host of grateful patients will be the reward of the surgeon who performs this treatment well. And now, with so many women in the war industries, we can definitely contribute something concrete to our war effort by relieving these sufferers of the disabling aches and cramps in their legs.

* * * *



Members of the Freshman Class, at the Red Cross Blood Donors Center in Chicago.

The ashes of a man weighing 135 lbs. would weigh more than the ashes of a woman weighing 160 lbs., it is stated.

NEUROSIS

(Continued from page 6)

linked with the name of Beard. This complex of symptoms is, in popular opinion, and, often enough, in the mind of some physicians, connected with an assumed weakness of the nervous system. These symptoms are generally present when one speaks of "nervousness." They are expressions of fatigue, which actually is a defensive attitude toward some life problems, but is subjectively felt as "physical" exhaustion. Here belong all the small symptoms of our daily life, irritability, weariness, sleeplessness, lack of memory, difficulty in concentration, various pains and aches, headaches, backaches, impotence and frigidity. These symptoms are very often superimposed upon some minor organic ailments, as in arthritic conditions, polyneuritis, sinus infections, and similar habitual disorders of organic origin. Then we have all the neurotic symptoms disturbing the functioning of certain organ-groups, gastrointestinal, cardiovascular, glandular, and vegetative disturbances. They are originally without pathological foundation, but through constant abuse of certain organs, pathological conditions may develop, like gastric ulcers, hyperthyroidism, and many other organic disfunctions, which are not yet recognized completely in their psychogenic origin. Most neuroses begin with rather simple symptoms and may then develop into quite complicated and organized psychopathological disturbances, the worst of them being the severe compulsive neurosis.

The selection of the nervous symptom presents an extremely interesting problem, and investigation of the development of various symptoms reveals the cleverness of the human mind. There are no definite rules why certain symptoms are produced and not others. In certain cases the symptoms develop in an organ group which offers less resistance. Inherited organ inferiorities make some organs more irritable and more responsive to nervous tension. Symptoms which were used early in childhood, in an attempt to gain attention or sympathy from parents, remain always a *locus minoris resistentiae*.

Symptoms are often continuations of an incidental disturbance; an upset stomach leads to a "nervous" stomach, an incidental acceleration of the pulse rate will be maintained and repeated, an actually frightening event is used to establish lasting violent fears. Such "causes" are merely occasions to which the neurotic's personality clings. Some symptoms develop as imitations of some neurotic or organic ailment observed in someone else. Parents very often invite children by their example to develop similar symptoms

which have proven their efficiency. As a rule every symptom presents the best and most effective answer a person has found in regard to his psychological needs. But we must keep in mind that these symptoms are chosen without any realization on the part of the patient. He remains completely unaware of his action. Otherwise he could not satisfy his conscience; he would not suffer acutely, as he does.

It seems difficult to comprehend how symptoms can be developed in accordance with one's needs. No doubt, nobody can produce symptoms deliberately. And yet the neurotic patient himself undoubtedly *has* created his symptoms. How can this be done? We know today the mechanism of establishing nervous symptoms. Two factors seem to be required: one is the psychic tension, which we have mentioned before. No symptom can be developed without it. This tension is provided by apprehension in regard to some life task. It is fundamentally the fear of obligations, of failure, of inadequacy. With this psychological strain the whole body is placed under tension. The second requirement seems to be paradoxical, but there can be little doubt of the facts: It is the desire to *overcome* some disturbance which creates the symptom. In other words, the symptoms can only develop *against* the conscious intentions of the patient. As long as the patient does not mind being sleepless during the night, either because he wants to think something through or because he wants to read or to do anything else, he does not suffer from insomnia. This disturbance starts when the patient decides he *must* sleep, he wants to sleep. He hardly realizes that, while trying so hard, he actually disturbs his slumber. He fails to realize, too, that for some reason he is interested in being sleepless, for one of many possible purposes. Insomnia is an adequate excuse for his failure in an examination, which is due the next day; it is a good reason to be grouchy the next day, which happens to be a Sunday, so that his wife must be especially considerate and careful. Many people are sleepless in order to excuse their otherwise unexplainable lack of efficiency. Many use insomnia to demonstrate to themselves and others how overburdened with responsibility they are. There is no limit to the possible purpose of each nervous disorder. But one fact is certain: that the symptoms—in this case insomnia—could not develop if the patient would not try so hard to fall asleep. A good demonstration of the neurotic mechanism is the following experiment: Grasp with your right hand your left hand, and try now, *with all the strength* you possess, to pull the left hand to the right side. If you really try it strongly enough, you will

find that you cannot move the hand at all. Consciously you feel only that you pull. You do not realize that while you are pulling, you hold the left hand back with equal force. That is the typical situation in any nervous disturbance: The patient does not realize how he himself offsets the terrific efforts which he makes to overcome his symptom. In this struggle with himself the patient increases merely his tension, which in turn helps to increase the symptom.

This fact can be used to demonstrate to the patient that it is in his power to produce or to stop any symptom. If one succeeds in persuading a patient to produce his symptom deliberately, the symptom will disappear. A patient who suffered from insomnia for a long time was told that he should try to see how long his strength would keep him from falling asleep. As a consequence he came next day, quite puzzled, with the report that for the first time in many months he fell asleep immediately as soon as he wanted to keep awake. This technique, called antisuggestion (Wexberg) is not a method of *treatment*, because there are deeper reasons for the existence of the symptom, which causes must first be removed before the patient can recover. But the prompt effect of the antisuggestion proves that no symptom can be maintained if the patient would stop trying to overcome it.

Every physician should become more thoroughly acquainted with the problem of neurosis, because he very often is the first one to be consulted by a patient with nervous symptoms. The general practitioner as well as the specialist in any field must know more than the pathology of the diseases which he is supposed to treat. He must understand human problems, especially their medical superstructure. Every so often the symptom is either not all medical, or only partially so, but actually psychological and social. The patient very often does not *want* to be relieved of his symptoms. He wants help, but he does not realize where he needs assistance. For the purpose of proper diagnosis it is not sufficient to make only a clinical examination. The absence of pathological findings is not enough for making the diagnosis of neurosis. If the patient suffers, he might be physically ill. But it might be, as well, that with his suffering he merely pays the price of declining his participation in life. The physician must be able to understand the patient as a human being, and not only as the bearer of some interesting organs. Insight into his social problems is essential for making a complete medical anamnesis.

Case History

Mrs. X, a 45 year old colored female complains of "spells" of weakness and nervousness for the past few

years, with increasing severity for the past few months. These symptoms are now so intense that she must sit down calmly for some time. She has the sensation that her heart ceases to beat. These "spells" hinder her from working. She has hot flashes and feels nervous and has "miserable feeling in her head."

The symptoms seem to be completely justified by the physical findings: B. P. 230/130, left ventricular hypertrophy, relative mitral insufficiency, and menopause. However, the referring physician felt that the reaction of the patient deserved psychiatric examination. Actually, her present life situation explains her "neurotic" use of her organic symptoms. Brought up by parents who took more interest in her schooling than in that of her other siblings, she always tried to excel. She was more charming, more intelligent, and more successful than her older sisters. Coming from a family of many professionals, she had looked forward to great success. Her marriage had failed, and now, on top of it all, she is physically handicapped and has no chance to play the role of a "queen" as she would like to do. She depends on her relatives, and has given up completely. She could work and support herself if she could accept a rather insignificant position. She could enjoy life and be useful if she would not compare what she can have with what she wants.

A neurotic aggravation is superimposed on organic ailment to offset the social pressure. If she were well—she would take a job, would go to work, would go out with men, would seek company. That is just what she should do. Not her organic ailment, but the neurotic component hinders her from fulfilling her life tasks. She needs encouragement and readjustment of her over-ambitious life-style as much as medical therapy.

Treatment of far-developed cases of neurosis requires special psychiatric training to analyze the situation and help the patient to reorientate himself. But the majority of cases is not so severe as to demand extensive psychotherapy. What the patient needs from any physician he consults is understanding of his physical ailment as well as of his personal situation.

It is not difficult to apply certain fundamental principles in dealing with patients whose symptoms might be functional. It should be possible, even with limited training to discover the social tendencies of neurotic symptoms. What the patient needs, then, is encouragement. Scolding, or indifferent disregard, will not help. The only way to help the patient in solving his problems, is to make him see and understand the situation. Giving advice is a very dangerous undertaking. If the patient were ready to act in the

right way, he would not need advice. And as he generally does not have the right attitude, the best advice will be in vain. Certain advice, though much given, is of special danger. Do not tell a patient he should get married! If life has been too difficult for him as he was alone, how will he be able to stand the much harder burden of additional responsibility? (That is true for men and girls alike!) Neither is sexual intercourse in itself a solution. Much harm is done by suggestions of this kind. Sending a patient on a vacation is very often pleasant—for patient and doctor alike. But it does not solve any basic problem. The patient returns to the same situation which was too difficult for him from the beginning. No, that is not the way to offer assistance. The answer to the difficulties must be more constructive.

The physician is a teacher. He teaches hygiene, he teaches behavior; he teaches diet and regulated life. Whatever any physician prescribes is a lesson. We must progress from mere physical education of our patients to other equally important fields of human life. The physician is one of the few persons in whom the patient might have full confidence; therefore he must assume leadership in his patient's social adjustment. Every physician can learn to increase the social interest of his patients. He is consulted on problems where courage and social interest might help the patient more than any medicine. The problem of neurosis is a challenge to medicine in general. The more all physicians understand it, the better for the medical profession and for mankind as a whole.

NEW BOOKS IN THE LIBRARY

- American Library Association; Rules for Filing Catalog Cards. 1942.
 Armour Laboratory; Pituitary Gland. c1940.
 Boyd, Wm.; Textbook of Pathology, 4th ed. c1943.
 Bradley, T. J.; Laboratory Manual of Qualitative Chemical Analysis. 5th ed. c1936.
 Brown, J. B.; Skin Grafting of Burns. c1943.
 General Electric Co.; Storage and Transfusion of Blood and Plasma. A bibliography (1943)
 Grant, J. C. B.; Atlas of Anatomy. vol. 1. 1943.
 Jones, H. W.; Green Fields and Golden Apples. c1942.
 Krieg, W. J. S.; Functional Neuro-anatomy. c1942.
 Lindsay, R. B.; General Physics . . . c1940.
 Lundy, J. S.; Clinical Anesthesia. 1942.
 Lynn, E. V.; Organic Chemistry. 1941.
 Mayo Clinic; Collected Papers, 1942, vol. 34. 1943.
 Moritz, A. R.; Pathology of Trauma. 1942.
 New York Academy of Medicine; March of Medicine. Lectures . . . 1942. 1943.
 Parke, Davis, & Co.; Blue Book. 1942.
 Rockefeller Institute of Medical Research; Studies, vol. 123. 1943.
 Searle, C. B.; Mineral Balance of the Human Body. 1926.
 Smith, A. W.; Elements of Physics. 4th ed. 1938.

The place where optimism most flourishes is the lunatic asylum.—Havelock Ellis.

* * * *

Tell me what you eat, and I will tell you what you are.—Brillatsavarin.

ABSTRACTS

TRAUMATIC SHOCK, ITS PREVENTION AND TREATMENT, Surgical Clinics of North America: April '43; Vol. 23; No. 2.

Following an injury, the victim is pale and cyanotic, perspiration is excessive, the extremities are cold and clammy, pulse is rapid, and arterial blood pressure is low. It is now recognized that shock varies under different conditions. Thus, post hemorrhagic shock differs from burn and traumatic shock.

Generally, shock is only recognized in its very late stages. Blalock and Price, however, have recognized early signs of shock by means of the following symptoms. A progressive fall in systolic pressure is a good sign except in shock following burns. A reduction in minute volume flow of blood through the skin is a diagnostic sign which is determined by pressing on the sternum and noting time for normal color to return. It generally takes longer than a second for color to return in shock development.

The empirical treatment of shock is rest, relief of pain with .01-.02 gram of morphine. Heat should be applied, but cautiously, to avoid peripheral vasodilation. The "Shock Position" should be assumed, elevated extremities and lowered head. This is not employed in cases of cranial or thoracic injuries. The use of adrenal cortical hormone is sometimes employed, but this measure is usually preventive instead of therapeutic.

A typical shock may be induced by hemorrhage. The symptoms are usually peripheral circulatory failure, imperfect cardiac filling and low blood pressure. If the hemorrhage is slow, treatment must follow within thirty minutes in order to prevent the shock from going to the irreversible stage.


In burns, if severe enough to cause blistering, a severe loss of plasma will follow within two hours. The general formula to follow in plasma administration is 50 c.c. of plasma per % of body surface blistered. Head is considered 6%, upper extremities 18%, trunk 38% and lower extremities 38%. The rate of plasma flow should be 200-500 c.c. per hour.

"UREA CLEARANCE AND DIURESIS," R. Domineque and E. Pomerene, J. Clin. Invest: 22: 1: 1: 1943.

This paper attempts to develop an equation for urea clearance which overcomes the inherent defects in multiple representations by means of an analysis of the data on the excretion of urea in 4 subjects, 1 nor-

(Continued on next page)

BOOKS



TRAIL TO LIGHT by Robert P. Parsons. Bobbs-Merrill Company, New York. 353 pp.

The writing of a review of this excellent book provides the opportunity for delivering a brief sermon on a subject which has long been dear to me. I hope my readers will allow me this license. The envious have only one recourse: read a book. Then they too may sermonize.

The reading of medical history and the acquisition of medical culture are almost wholly neglected in the education of the average medical student. Many feel these to be wholly unnecessary. And my sermon is concerned with pleading for this almost lost cause.

We at school are too often influenced by "practical" men, are impressed by "snap" diagnoses, and are frequently content with superficial knowledge and understanding.

The hero of our story, Dr. Joseph Goldberger, was made of different stuff. He was a true medical scientist. His approach to problems was all-embracing. As his story unfolds it will be seen that he studied and worked as few men do. He had an infinite capacity for detail, and his published works were incontrovertible.

The book is fascinating. The author has succeeded in weaving together factual material and producing a book as absorbing as any fiction you've read. The years at school, at work in the Public Health Service, the researches in typhoid, yellow fever, dengue, parasitic worms, typhus—will all hold your undivided interest. The story of the work on pellagra, with its

final human experiment on Dr. and Mrs. Goldberger and some assistants—this was one of the great moments in medical history.

I would recommend this book to the student whose sole purpose in life is not twenty-thousand a year, or a career in medical politics, but rather the honest practice of medicine with possible contribution to the advancement in medical science. Let Goldberger be your inspiration for study and research—and place in their proper light, the mercenary tendencies of our times.

ABSTRACTS

(Continued from page 32)

mal, and 3 nephrosclerotics. By means of this equation the authors follow the changes in the clearance curve in renal disease, and discuss the concentration ratio of urea.

The concentration ratio of urea is the ratio of its concentration in urine and its concentration in the blood plasma. The values for the concentration ratio correspond with the values of concentration tests of renal function. The advantages of the concentration ratio are that it is not limited to any specific amount of diuresis, and that it holds for any diuresis. The concentration ratio also shows that with large diureses, the greater the diuresis, the greater the urea clearance. The authors conclude from their data that the behavior of the concentration ratio of urea at large diureses may be generalized to other substances excreted in the urine.

The authors conclude that, in man, the urea clearance rises continuously with diureses at all diureses, both in health and in renal disease. This effect occurs in nephrosclerosis, both with intact renal innervation and after denervation. They also conclude that the concentration ratio of urea and urea clearance are mutually equivalent at all diureses. The limiting concentration ratio is recommended as the most sensitive index of urea excretion, and it is suggested that this conclusion applies to other substances, such as inulin and creatinine.

ULYSSES S. GRANT (1822-1885)

It is the year 1884. The distinguished Civil War hero and twice elected President of the United States, Ulysses S. Grant is sitting on the porch of his Mount McGregor home, writing his memoirs. He suffers greatly, but uncomplainingly, from throat cancer. To add to his trials, he has become penniless, due to the frauds of two partners in a banking venture. For this reason he is determined to finish his book, so that he may leave something for the support of his wife.

LEUKEMIA

(Continued from page 15)

show lymph node and splenic enlargement and sometimes a moderate enlargement of the liver, (to 2000 grams; normal 1500 grams). In addition, there is a hyperplasia of the bone marrow, and most of the fatty bone marrow is converted to red hyperplastic marrow. The author usually opens the shaft of the femur, which is normally fatty in an adult; here any change from the fatty is apt to be very striking.

Acute leukemia, as stated above, may be myelogenous, lymphatic, or monocytic (or occasionally some rarer form). Acute leukemia differs greatly, clinically, from chronic leukemia; in fact so much so that some investigators have felt it is a different disease entirely.

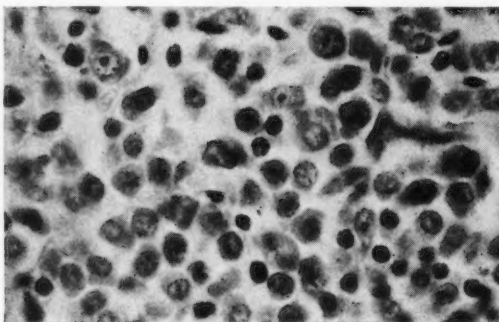


Figure 6. Lymph node section from a case of leukemia. Notice that the normal structure of the node has been replaced by a marked hyperplasia of the immature blood cells with one mitosis present. This is from a case of monocytic leukemia; here the lymph node is producing only monocytes.

Basically, however, it resembles chronic leukemia in that the essential pathology is an abnormal, excessive proliferation of white blood cells in the blood forming organs.

From the clinical point of view, acute leukemia may have some of the features of chronic leukemia, namely, the enlarged spleen, lymph nodes, or there may be no enlargement. The outstanding clinical features are most apt to be one or more of the following: weakness, marked anemia, septic fever, severely infected and often ulcerated throat, and bleeding in various locations, such as, rectum, gums, other mucous membranes and skin. If the large spleen and lymph nodes are absent (which is most often the case), the clinical picture is usually one of sepsis, anemia, and hemorrhages in any possible combination. Sometimes one feature is more prominent than another. The illness may be discovered because of marked pallor;

it may first attract attention because of a bad sore throat, a fever; the seriousness of the condition may first become apparent when a tooth socket bleeds for days following a simple extraction.

The clinical course in acute leukemia is much shorter as a rule than the course in the chronic form. A few weeks to a few months is the rule, with the patient going rapidly downhill and reaching a fatal termination in a short time. Occasionally a chronic leukemia will end with the clinical picture of an acute leukemia, an occurrence which is usually spoken of as an acute exacerbation of a chronic leukemia.

The blood findings in acute leukemia are apt to be less striking than those in the chronic forms, the white blood cell count often being between 10,000 and

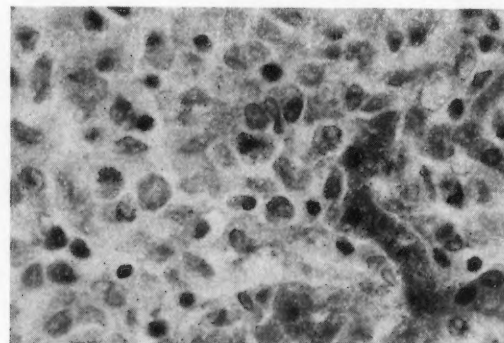


Figure 7. Liver section from a case of leukemia showing a leukemic infiltration replacing the normal liver cords. This occurrence is possible because the liver can revert to its fetal ability to produce blood cells.

30,000, but higher counts (sometimes very high) do occur at times. The hemoglobin is usually 30% or less and the red blood cell count is 1,500,000 to 2,000,000 (even if no severe bleeding has occurred). In fact, the severe anemia of an acute leukemia is usually so striking, that most men are accustomed to rule this diagnosis in or out on the basis of anemia. If there is a possible diagnosis of acute leukemia with a red blood cell count of 4,000,000, the writer is inclined to disregard this diagnosis.

At autopsy an acute leukemia case may or may not show the enlarged liver, spleen, and lymph nodes mentioned under chronic leukemia, but it will almost always show a hyperplastic bone marrow, a septic spleen, a marked anemia, and sometimes a marked hemorrhagic diathesis with hemorrhages in the skin and most of the internal organs.

Another confusing feature of leukemia (which was purposely left to the last) is the fact that there are

the so-called *subleukemic* and *aleukemic* forms. These may occur with any of the above types of acute or chronic leukemia and often make the diagnosis considerably more difficult. By subleukemic leukemia is meant one in which the white blood cell count is normal, (4,500 to 11,500) but the differential count shows the same abnormal immature white blood cells seen in leukemia with high white blood cell counts. In myelogenous leukemia these abnormal cells come from the myelocytic series (myeloblasts, myelocytes). In lymphatic leukemia the abnormal cells are of the lymphatic series (young lymphocytes, occasionally lymphoblasts); and in monocytic leukemia the abnormal cells stem from the monocytic series (monoblasts, young monocytes). An aleukemic leukemia not only has a normal white blood cell count, but also a normal differential count. These forms (subleukemic and aleukemic) are, nevertheless, forms of leukemia because they have the underlying essential changes in the blood forming organs (abnormal, excessive hyperplasia). In aleukemic leukemia the diagnosis may be made on biopsy of a lymph node, or on sternal or splenic puncture.

Finally, it must be mentioned that the ultimate prognosis in leukemia is nil. Small doses of X-ray are used in chronic leukemia and they may lower the white blood cell count, shrink the spleen, and make the patient somewhat more comfortable, but it is doubtful if it prolongs life. X-ray is contraindicated in acute leukemia (because of the anemia) and the only treatment of this form is blood transfusions which are only palliative. We must not give up hope, however, that something of permanent value will some day be discovered, and we must encourage all investigative work on leukemia. We must bear in mind that at one time pernicious anemia was also considered a fatal disease.

The famous George Cheyne who was a man of enormous bulk, reduced himself by dieting from 32 stones (448 lbs.) to proper dimensions. One of his aphorisms says:

"Every wise man after 50 ought to begin and lessen at least the quantity of his ailment, and if he would continue free from great dangerous distempers and preserve his senses and faculties dear to him, he ought every 7 years to an abating gradually and sensibly, and at least descend out of life as he ascended into it, even into a child's diet."

* * * *

Extreme remedies are very appropriate for extreme diseases.—Hippocrates.

CRYPTORCHIDISM

(Continued from page 19)

spermatozoa in the tubules three months after scrotal replacement.

Another investigator to experiment on the problem of the effect of scrotal replacement of cryptorchid testes was Takewaki (1934). He found that experimentally induced cryptorchidism in the mouse did not destroy spermatogenesis permanently. Spermatogenesis was (continually) only slightly impaired by cryptorchidism, or was regained after temporary degeneration of the germinal epithelium. While spermatogenesis in the mouse was attenuated by cryptorchidism, the influence of abdominal retention was less than in the rat, guinea pig, and other mammals.

Because of the profound changes produced by cryptorchidism in the affected testis, it has been suggested that hormone secretion is also affected by removal of the testis from the influence of the scrotum.

Oslund (1924) found that interstitial tissue hypertrophy is associated with atrophy of the germinal epithelium in cryptorchid testes. He also found that in cases where there was a degeneration of germinal epithelium with no interstitial cell hypertrophy, the intertubular spaces were increased in size and filled with lymph. He concluded, therefore, that tension and pressure are important factors in the production of an increased number of interstitial cells, in cryptorchidism.

Moore (1926) found, in experimental cryptorchidism in guinea pigs, that in spite of the absence of germ cells, the accessory organs of reproduction, as studied by refined methods of hormone production, function at a maximum capacity for months. From this he concluded that cryptorchid testes, as judged by hormone detection tests, secrete as much hormone as do two normal testes weighing more than thirty times the single degenerate organ of these experiments.

However, in later experiments, it was found that cryptorchid testes secrete smaller amounts of hormone than normal ones, since approximately one-half the amount per gram weight of tissue, assayed in bird units, was obtained from them as compared with normal testes (Hanes and Hooker, 1937).

Jeffries (1931) made a study of the reactions of the rete testes to experimental cryptorchidism, both from the standpoint of spermatogenetic activity and hormone production. He found that degeneration changes made their appearance in the germinal epithelium 3-5 days after elevation of the testis into the abdomen. It was rapidly progressive, but somewhat variable, and within 2-3 weeks practically all

cells of the germinal line had disappeared, or some tubules continued to show dividing spermatogonia and perhaps spermatocytes, but spermatozoa were never found. Indicators of testis hormone, such as the cytology of the prostate and seminal vesicle showed these glands to be entirely normal two months after abdominal elevation of one testis and removal of the opposite one. Since the indicators serve to register hormone absence for periods as short as 3-5 days, Jeffries concluded that hormone secretion by the severely injured testis suffered no interference; and therefore, the function of spermatogenesis is unrelated to hormone secretion, in the testis of the rat.

Mottram and Cramer (1923) first suggested the idea that the interstitial tissue of the testis produces one hormone that controls the accessory organs of reproduction and the germinal epithelium produces another separate substance that controls the state of the anterior lobe of the pituitary gland. Support was given to this idea by Martins and Rocha (1931) who found that in rats subjected to experimental cryptorchidism, involving a degeneration of the germinal epithelium, normal accessory organs of reproduction may be present, yet "castration cells" show in the hypophysis.

McCullough (1932) and Witschi, Levine and Hill (1932) added more findings to substantiate Mottram's and Cramer's claims. Their evidence was derived from the evidence that a loss of germinal epithelium in rats through castration, radium, or X-ray destruction, or experimental cryptorchidism lead to changes in the cells of the anterior pituitary, accompanied by a more pronounced stimulating activity of the gland, and with retention of functional accessory reproductive organs in these cases, except after castration.

Later experiments showed that the occurrence of "castration cells" in the pituitary gland of cryptorchid rats depended more on threshold responses and concentration of hormone than a loss of a specific germinal epithelium hormone. Nelson (1934) showed that cell changes appeared in experimental cryptorchid rats within 75 days, and as hormone secretion decreased they became more prominent; the hormone content became so low by 240 days that the seminal vesicles were entirely castrate in type but not sufficiently low by 400 days as to materially affect the prostate which responds to lower hormone concentrations than either seminal vesicles or anterior pituitary. The cryptorchid testes, without germinal epithelium, responded to the action of injected gonadotropic substances by greater hormone secretion which caused the seminal vesicles to increase in size by as much as

nine times, and to correct the pituitary changes induced by low hormone concentrations.

Hanes and Hooker (1937) ran quantitative experiments to determine the effect of cryptorchidism on hormone production. Assay upon capons of extracts of hog testes revealed the undescended testis to contain per unit weight of tissue approximately half as much hormone as does the scrotal testis tissue.

BIBLIOGRAPHY

1. Bouin and Ancel. *Allen*, "Sex and Internal Secretions." 1932. p. 350.
2. Crisler, G. The heterogenous testis transplant problem applied to white rats and mice. *Am. J. Physiol.* 90:623. 1929.
3. Griffiths, J. The structural changes in the testicle of the dog, when it is replaced within the abdominal cavity. *J. Anat. & Physiol.* 27:483. 1893.
4. Heller, R. E. Cowper's Gland as a testis hormone indicator. *Proc. Soc. Exper. Biol. & Med.* 27:751. 1930.
5. Hanes, F. M., and C. W. Hooker. Hormone production in the undescended testis. *Proc. Soc. Exp. Biol. & Med.* 35(4):549-550. 1937.
6. Jeffries, M. E. Hormone production by experimental cryptorchid rat testes as indicated by the seminal vesicle and prostate cytology tests. *Anat. Rec.* v. 48, no. 1. 1931.
7. Lawrence, W. The fate of the germinal epithelium of experimental cryptorchid testes of guinea pigs. *Biol. Bull.* 51:120. 1926.
8. Martins, T., and Rocha, A. The regulation of the hypophysis by the testicle, and some problems of sexual dynamics. *Endocrinology.* 15:421. 1931.
9. McCullough, D. R. Dual endocrine activity of the testes. *Science* 76:19. 1932.
10. Mottram, J. C., and Cramer, W. *Allen*, "Sex and Internal Secretions."
11. Moore, C. R. The activity of displaced testes and its bearing on the problems of the function of the scrotum. *Am. J. Physiol.* 77:59. 1926.
12. Moore, C. R. The relation of the scrotum to germ cell differentiation in gonad grafts in the guinea pig. *Am. Naturalist.* 60:324. 1926.
13. Moore, C. R. Scrotal replacement of experimental cryptorchid testes and the recovery of spermatogenic function (guinea pig). *Biol. Bull.* 51:112. 1926.
14. Moore, C. R. Supplementary observations on mammalian testis activity. I. Vasa-efferentia ligation. II. Atypical scrota. *Anat. Rec.* 48:105. 1931.
15. Moore, C. R., and Quick, W. J. The scrotum as a temperature regulator for the testes. *Am. J. Physiol.* 68:70. 1924.
16. Nelson, W. O. Effect of gonadotropic hormone injections upon hypophyses and sex accessories of experimental cryptorchid rats. *Allen*, "Sex and Internal Secretions," 1939. 1934.
17. Oslund, R. M. Interstitial cell hypertrophy. *Am. J. Physiol.* 69:589. 1924.
18. Oslund, R. M. Cryptorchid testes and testicular hormone production. *Am. J. Physiol.* 71:76. 1926.
19. Sand, Knud. *Allen*, "Sex and Internal Secretions," 1932. 1921.
20. Takewaki, Kiyoshi. Spermatogenic function of the cryptorchid testis of the mouse. *J. Fac. Sci. Imp. U. Tokyo. Sec. 4, Zool.* 3(3):319. 1934.
21. Witschi, E., Levine, W. T., and Hill, R. T. *Allen*, "Sex and Internal Secretions," 1939. 1932.

SPECTROSCOPY

(Continued from page 9)

remained in place. An intelligent man, but not a scientist, he was puzzled by the phenomenon, and the following day he consulted a scientist friend, David Rittenhouse in quest of an answer. One year later, in 1786, Rittenhouse read his answer before a meeting of the American Philosophical Society. In place of the silk handkerchief Rittenhouse had stretched hundreds of paralleled hairs, evenly spaced, over a small frame made for him by his watchmaker. When he held this frame with the hairs parallel to a slit in a shutter of a darkened room of his home a beam of light striking the frame produced a spectrum. He had discovered the grating spectrum. In reality, Hopkinson had duplicated the work of Father Grimaldi, and Rittenhouse

had modified and extended the work of Newton. A few years later (in 1800) Herschel placed thermometers in the dark region adjoining the red end of the spectrum, and thereby discovered the infra red heat rays. One year later, in 1801, Ritter placed strips of paper, which had been dipped into a solution of silver chloride, in the dark region adjoining the violet end of the spectrum, and thereby discovered the ultra violet rays, as proved by the blackening of the paper strips.

The field was now set for the full development of spectroscopy, and in 1802, Wollaston, a London physician, who practiced medicine as a livelihood, but devoted his spare time to spectroscopy, as a hobby, discovered the dark lines of the solar spectrum. He did not discover all of the dark lines, but only a few of the very prominent ones, since he was using the rather simple optical arrangement that had been used by Newton. However, in 1817, Fraunhofer, a Bavarian instrument maker, observed the sun's spectrum through a telescope, and not only discovered many new dark lines, but assigned them to definite positions in the spectrum, and explained their presence as being due to the cooler gases in the sun's envelope which acted as an absorbing medium. He proved his theory by surrounding a light source with vapors, and produced dark lines in this way. Absorption spectroscopy was thus first demonstrated as existing in the sun, and astronomers still make use of it for many researches on the astral bodies. Biochemists, however, find its greatest usefulness in studying compounds, which indirectly owe their existence to the sun's energy, but exist at more comfortable temperatures on mother earth.

The spectrum, or a rainbow, which is a natural spectrum where nature uses droplets of rainwater in the sky to disperse white light as effectively as can be done by man with a prism or a grating, is a beautiful sight, and a balm to the artistic soul. To a hard-headed scientist, however, it is something else, for each color of the spectrum represents a different level of radiant energy, ranging in decreasing intensity from the violet through to the red. Now chemical compounds have the peculiar property of absorbing only certain levels of radiant energy and each compound has its own characteristic choice. Therefore, if we permit narrow bands of light to fall on a solid, liquid or gas in a suitable container, and measure the amount of absorption or transmission (absorption plus transmission being equal to 100%) for each narrow band, then we should be able to plot a characteristic curve for any chemical compound. For our ordinate we can

use per cent transmittance, and for our abscissa the wave length of the very narrow band of light used. Light is a form of wave motion, at least it has some characteristics of wave motion, and a wave length can be assigned to each color or energy level. The violet end of the spectrum has the most energy and the shortest waves starting at 400 millimicrons, while the red end has the least energy and the longest waves ending at 700 millimicrons. An example of such a curve is shown in Figure 1. The absorbing material used was potassium permanganate which is convenient for demonstration. Such a curve tells one the kind of material that absorbs the light, but not the quantity or concentration. An inspection of the curve shows that the region of greatest absorption or smallest transmission lies at 530 millimicrons. Therefore, this should be the most desirable region of the spectrum to use for quantitative work, and we should set our instrument by turning the wave length drum to 530. This drum is attached to the monochromotor which can be either a prism or a grating since either will disperse white light into a spectrum. The drum and monochromotor are so synchronized that a beam of colored light corresponding in wave length to that recorded on the drum, will be focused on the absorption cell.

Leaving our instrument, which for this demonstration is called a spectrophotometer since it contains a photoelectric cell, set at 530 millimicrons, we can use various concentrations of potassium permanganate and obtain the transmittance for each concentration. If we now plot a second curve using transmittance for the ordinate as was done previously, but concentrations of potassium permanganate for the abscissa, we will obtain a strange looking curve having various points in inflection, and it is difficult for one to see the correlation between transmittance and concentration. But if we apply the law of Beer, which tells us that transmittance is a logarithmic function of concentration, we can plot our curve on semi-logarithmic paper (See Fig. 2), and obtain a linear curve. Having once obtained such a curve for any substance, a future determination of an unknown concentration is easy. Simply obtain the transmittance and follow this abscissa along the graph to where it meets the linear curve or slope, and then down on that ordinate to the base line. There the concentration can be read.

Quantitative methods based on the use of graphs such as the one shown in Fig. 2 have found extensive use in biochemistry and clinical pathology in the analysis of body fluids. Such methods are in general more rapid, sensitive and accurate than the ones that

have been used in the past. Dr. Hoffman, of the Chicago Medical School, has been active in the development of such methods. Recently such a method was developed in a South American laboratory for the analysis of insulin, thus obviating the slow and costly bioassay of the past. Qualitative methods, making use of graphs similar to the one shown in Fig. 1 have helped greatly in the growth of biochemistry. Recently such a method was used to show that the ear of an albino mouse, which was being irradiated daily with ultra violet light, gradually transmitted less of these wave-lengths, although no melanin was being formed. This work has given us a new viewpoint in regard to the prevention of sunburn. The question often arises concerning the denaturation of proteins that dried while in the frozen state. This matter is of particular interest to the armed forces at the present time in regard to the operation of blood banks. The spectrophotometer showed that the same identical curves were obtained for both dried and undried catalase, indicating that denaturation had not occurred. The author is using a spectrophotometer at the present time to make a study of certain conjugates that can be prepared in liquid ammonia, and that have a pharmacological value. For example, epinephrine and glycine can be conjugated to give a new pressor substance of prolonged action; likewise, insulin and hematin, for a prolonged blood sugar lowering. The use of the methods of organic chemistry are uncertain and destructive in the analyses of such conjugates. Most proteins absorb strongly in the near ultra violet due to the presence in them of tyrosine, tryptophane and phenylalanine. All proteins have a terminal absorption in the far ultra violet which is due to straight chain amino acids. This terminal absorption is not specific. The attachment of a protein, even by covalent bonds, to another absorbing substance will often alter the absorption by that substance greatly. For example, hemin absorbs weakly in the visible spectrum and globin not at all, but hemoglobin has a very marked absorption in the visible range. In the future, it is quite possible that the detection of secondary valences in biological compounds, free and in situ, will prove to be one of the greatest contributions of spectroscopy to science.

CORONARY

(Continued from page 17)

crease the danger of dislodging mural thrombi after occlusion. Furthermore, the resultant rise in intraventricular pressure may cause aneurysmal dilatation of the infarcted ventricle, or may increase any already

existing dilatation. Thirdly, digitalis is believed to cause constriction of the coronary arteries. The constriction may occur both directly, by the smooth muscle action of digitalis, and indirectly, through nervous impulses mediated by way of the centrally stimulated vagus. And this may lead to the possibility of fibrillation mentioned above.

There are indications for the use of other drugs when other factors complicate the condition of coronary thrombosis. With failing pulse and evidences of cardiac collapse, caffeine citrate administered intravenously in doses of 0.3 to 1.0 gm. has proved to be very effective. This should be repeated as indicated by the evidences of feeble pulse and its response to the drug. Coramine may also be used instead of the caffeine—2 to 3 c.c. intramuscularly. In the presence of very grave circulatory failure or cessation of pulse beats, epinephrine may be administered intravenously and intracardially. This may tide the patient over the crisis and permit the regular form of therapy to be applied.

Quinidine sulfate is indicated in cases of auricular and ventricular tachycardia and heart block. The routine giving of quinidine sulfate has been advised as a measure to minimize the possibility of the development of ventricular fibrillation by using 0.4 gm. three to six times a day for a week or ten days following the occurrence of the infarction. However, this has been opposed by the evidence presented by Schwartz and Jezer who have shown that quinidine sulfate may increase the tendency to the development of ventricular fibrillation in patients subject to transient seizures of this form of arrhythmia.

Intravenous aminophyllin has also been utilized in acute attacks. While it has a stimulating effect on the myocardium and acts as a coronary dilator, its effectiveness is questionable. However, it is effective in cases of paroxysmal dyspnea and Cheyne-Stokes respiration, and thus has its use in certain instances.

The left ventricular failure seen in coronary thrombosis may be manifested on one side by pulmonary engorgement and on the other by decreased cardiac output with resultant shock. The almost pure picture of shock is encountered most often when major myocardial infarction occurs in an individual who had no previous heart failure. The symptoms of pulmonary and perhaps systemic venous congestion usually predominates when myocardial infarction afflicts an individual who already had heart failure as a result of coronary sclerosis and often also hypertension. This shock must be overcome. In many instances, especially initial attacks in individuals without pre-

existent heart failure, it is judicious to treat the victim as a sufferer from shock with only secondary attention, for the time being, to the question of the underlying cardiac failure.

The application of heat, and elevation of the foot of the bed are indicated. The intravenous administration of fluids may be hazardous. This may place an added burden on the very much weakened heart and cause further embarrassment. 100 cc. of 50% dextrose I.V. has been advocated. Stimulation is best avoided if the systolic blood pressure is 100 or over. A measure of utmost value is the administration of high concentrations of oxygen in the severe cases. It is indicated when there is cyanosis or dyspnea and especially in the presence of well-marked congestion or edema of the lungs. Oxygen generally clears up the cyanosis and greatly diminishes or relieves dyspnea. It often decreases the cardiac pain which has been attributed to myocardial ischemia. The best method for the administration of oxygen is the oxygen tent or mask, or nasal catheter, if the first two are not available. The concentration of oxygen should generally be kept at 50%.

In the first few days of severe coronary thrombosis, the patient should be given only fluids by mouth, administered very slowly by the nurse. If orange juice or milk increase abdominal distention, as they sometimes do, they should be discontinued. Because of the profuse sweating, fever, and perhaps vomiting, the thirst of the patient may be so great that considerable amounts of fluid are needed. But on the principle of avoiding as much activity as possible, the smallest amount of fluid feasible should be given in the first days of major attacks. In some cases vomiting due to the cardiac lesion or to morphine makes it difficult to give fluids by mouth. If the vomiting persists, physiological saline may have to be given under the skin with as little disturbance to the patient as possible. Large intravenous infusions would seem to be contraindicated because of the danger of pulmonary edema.

The morphine generally results in constipation. It is well that the patient should not be disturbed to move his bowels during the first two or three days, especially if distention does not develop. After the third day, a small enema or low irrigation may be given. After the first few days mild laxatives may be attempted. Distention is often a troublesome symptom. A rectal tube may afford some relief. The use of pituitrin and prostigmin appears to be a dangerous practice because of the pressor effect.

Embolization of mural thrombi from the endocardial

surface of the infarct constitutes a danger in the second and third week. There is not much that can be done with the exception of keeping the patient as quiet as can be. The possible use of heparin to prevent the formation of such mural thrombi and their extension should be considered.

A considerable proportion of cases of coronary thrombosis occurs in diabetics. One must be very careful in the administration of insulin to such patients. Insulin hypoglycemia increases the work of the heart and the injection of insulin may intensify the symptoms of coronary thrombosis. This may go on to a fatal outcome. Unless, therefore, progressive ketosis necessitates the use of insulin, it should be omitted in individuals with coronary thrombosis. If insulin must be given, it should be covered with glucose by a very large margin, no matter how great the glycosuria, so that there is no possibility of hypoglycemia.

In the convalescent period following the acute attack, the patient must be kept in bed for a protracted period. This apparently aids in the formation of a strong and small scar. It should hardly be less than a month even with what seems to be small infarcts. With large infarcts, a longer duration of bed rest—six weeks to two months—is desirable, even though the patient is asymptomatic. During this period the patient is best kept on a low-calorie diet with fluid and salt restriction. If symptoms of heart failure are present, the patient is best treated according to the general principles for management of cardiac insufficiency. After the first two or three weeks, the contraindications to the use of digitalis no longer apply and the drug may be of great value in aiding the development of cardiac reserve. If indicated, mercurial diuretics may also be used in heart failure following coronary thrombosis.

The subsequent management should be designed to prevent the development of cardiac failure. This should include the control of deleterious conditions. General or focal infections should be eradicated. Any form of chronic intoxication should be eliminated. Existing anemia must be combated and corrected. And general preventive hygiene procedures should be taught to the individual. All this is done with the purpose of eliminating any possible strain on the myocardium and giving it the chance to rebuild its reserve. The habits and the manner of life of the individual should be regulated to protect the heart from overtaxation. Mental and physical exertion must be curtailed to within a safe proportion of the estimated cardiac reserve.

JAZZ

(Continued from page 13)

the nation. The feeling was not all favorable, however. The opposition was led by Daniel G. Mason, who said "Ragtime is the musical expression of an attitude toward life, an attitude shallow, restless, avid of excitement, incapable of sustained attention. It is a meaningless stir-about. . . . Better than bad music is no music, and we should insist that better the subway gongs and automobile horns than this excrescence on the face of our art."

Professor Mason was yielding to the old and treacherous temptation to moralize about music; it led him into the ludicrous position of considering whether there ought to be a music which millions were already singing. Ragtime of light pieces, like *Mr. Jefferson Land* and *Play That Barbershop Chord*, have a permanence which is open to question. But ragtime had things in it which were similar in ideology to Stravinsky's music; they both contained formal innovations which produced new musical pleasures. The ragtime innovations were full of musical potentialities, however badly they were used in ragtime. Ragtime was a popular demonstration of the immense appeal of polyrhythm, a field which as stated above, was attracting the attention of classical composers. In fact, part of the latter's stimulus came from ragtime, and Stravinsky named one of his compositions *Ragtime*.

Many people feel that rhythm is a shady, immoral, hip-rolling part of music which is inferior and rudimentary to melody and harmony. I have heard musicians question whether rhythm ought to be regarded as musical at all, which is like wondering whether the timing of nerve impulses and the speed of conduction of nervous tissue ought to be regarded as having anything to do with the human race! Because jazz and ragtime are so largely constituted of rhythm, it might not be amiss to state a few basic concepts.

First of all, what is the distinction between rhythm and beat? Beat is the fundamental pulse of the music, either played or understood. Rhythm is the pattern in time played with the beat as a basis; it is the music's whole design or motion in time. Melodies and harmonies are *sounds in time*. Rhythm, in short, cannot be set aside from the other elements in music. Therefore, a music whose rhythm is radically different from that of other music will inevitably be a music where whole texture is radically different. It must be remembered that there are whole areas of suitable rhythmic possibilities which Western music has never entered. Thus, Arabian music has commonly 5, 7 and 11 beats to the bar, with a syncopated cross

rhythm in threes or fours (be patient, I'll define it.)

Since 1900, Western music has begun to explore these fields and one approach has been through ragtime. Rag music, then, is syncopated music. Syncopation is "the displacement of the regular metrical accent" which occurs when the rhythmic accent falls anywhere off the beat. It is quite common in classical music, the works of Schumann being good examples. These traditional syncopations have certain characteristics. They represent parts rather than the whole, i. e., they are intermittents and they are confined to either melody or harmony, and they occur regularly, that is, at the same beat in each bar.

In ragtime, however, both melody and harmony are syncopated, sometimes against each other (polyrhythmically) and the syncopation is not intermittent but continuous. This beat alteration acts as a mental stimulant which furnishes nervous thrills for the ragtime fans. For those who like psychoanalytic suggestions, it might be said that the ragtime public enjoyed being moved out of the rut of the established bent. As Cerona says "Rhythm can be either suspended or resolved. A suspended rhythmical note is one which occurs off the beat. In suspended rhythm the effect on the listener is that of urging him on to the next note. When this effect is prolonged, the listeners become avid of excitement and the wish to dance."

Ragtime, then, makes a principle of continuously suspended rhythms. It only began to hint at the possibilities in this regard. The possibilities were shown in their full subtlety by jazz itself.

Ragtime was popular, published music. Jazz is a pure outgrowth of folk music; it is music of the people stemming from their lives, and borrowing heavily from a race which has a remarkable capacity for lack of bodily tensions, for ease and fluidity of movement, in short, for rhythmic suspension. These people developed the jazz form.

Subtlety and suavity have replaced the crudities of the early primitive origins of jazz. It has developed just as classical music arose from its early tribal origin to its present sophisticated position.

The object of this article has been to show that jazz, for all its inanities, its frivolities, and its unfortunate association with the less stable elements of the population is based on sound musical theory, and has a respectable background. It definitely has something to contribute to the art of music, and it would be criminal folly to allow the perverse pride and reactionary prejudices of our musical Tories to prevent this contribution from taking place.